

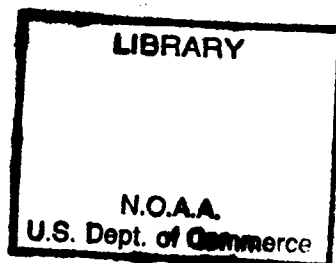


THE ARAB REPUBLIC OF EGYPT

ANNUAL METEOROLOGICAL REPORT

1969

Gc
991
.E3
M62
1969



THE EGYPTIAN METEOROLOGICAL AUTHORITY

CAIRO

National Oceanic and Atmospheric Administration

Environmental Data Rescue Program

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages

Faded or light ink

Binding intrudes into the text

This document has been imaged through the NOAA Environmental Data Rescue Program. To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or www.reference@nodc.noaa.gov.

Information Manufacturing Corporation
Imaging Subcontractor
Rocket Center, West Virginia
September 14, 1999

QC
991
.E3
M6a
1969



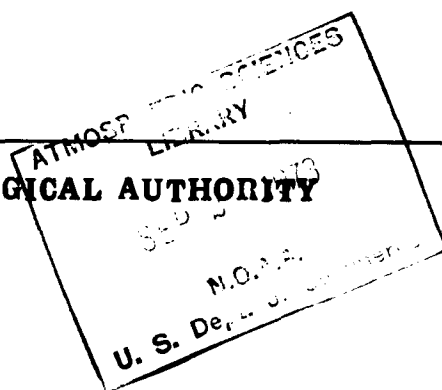
THE ARAB REPUBLIC OF EGYPT

ANNUAL METEOROLOGICAL REPORT

1969

THE EGYPTIAN METEOROLOGICAL AUTHORITY

CAIRO



PUBLICATIONS OF THE METEOROLOGICAL AUTHORITY OF THE ARAB REPUBLIC OF EGYPT—CAIRO

In fulfilment of its duties, the Egyptian Meteorological Authority issues several reports and publications on weather, climate and agro-meteorology. The principal publications are described on this page.

Orders for publications should be addressed to :

"Chairman of the Board of Directors, Meteorological Authority, Kubri-el-Qubbeh — CAIRO".

THE DAILY WEATHER REPORT

This report is issued daily by the Meteorological Authority since the year 1901. It includes surface and upper air observations carried out by the relevant networks of the Republic at the principal hours of observations.

As from January 1968 this report was revised to include a condensed representative selection of surface and upper air observations besides the 1200 U.T. surface & 500 mb charts.

As from 1st January 1972, the Daily Weather Report will not be issued or distributed because it does not serve no longer any good purpose as it used to be in the past. The Meteorological Authority is ready to supply the recipients of the Report with any information used to be included in it, if they so desire.

THE MONTHLY WEATHER REPORT

First issued in 1909, the Monthly Weather Report served to give a brief summary of the weather conditions that prevailed over Egypt during the month, with a table showing the mean values for few meteorological elements and their deviations from the normal values. From 1954 to 1957 this report was in a rapid state of development and extension resulting into a voluminous report on January 1958 giving surface, upper air, and agro-meteorological data for Egypt.

As from January 1964, the Monthly Weather Report was pressed to give climatological data for a representative selection of synoptic stations.

THE AGRO-METEOROLOGICAL ABRIDGED MONTHLY REPORT

Gives a review of weather experienced in the agro-meteorological stations of Egypt as well as monthly values of certain elements.

THE ANNUAL REPORT

This report gives annual values and statistics for the various meteorological elements, together with a summary of the weather conditions that prevailed during all months of the year.

CLIMATOLOGICAL NORMALS FOR EGYPT

A voluminous edition was issued in March 1968 which brings normals and mean values up till 1960.

METEOROLOGICAL RESEARCH BULLETIN

First issued in January 1969 on a bi-annual basis. It includes research works carried out by members of staff of "The Meteorological Institute for Research and Training" and the Operational Divisions of the Meteorological Authority.

TECHNICAL NOTES

As from October 1970, the Meteorological Authority started to issue a new series of publications in the form of Technical Notes (non periodical) on subjects related to studies and applications of meteorology in different fields for the benefit of personnel working in these fields.

CONTENTS

	PAGE
Foreword	1
Introduction	3,4
Explanation of the Tables	5-14
List of Stations Appearing in the Report	15
General Summary of Weather Conditions	16-20

SURFACE DATA

Table A1.—Annual values of the Atmospheric pressure, Air Temperature, Relative Humidity, Bright Sunshine, Duration and Piche Evaporation	21
„ A2.—Maximum and Minimum Air Temperatures	22
„ A3.—Sky Cover and Rainfall	23
„ A4.—Number of Days of Occurrence of Miscellaneous Weather Phenomena	24
„ A5.—Number in Hours of Occurrences of Concurrent Surface Wind Speed and Direction Recorded Within Specified Ranges	25-26

UPPER AIR DATA

Table B1.—Annual Means and Annual Absolute Higher & Lower Values of Altitude, air Temperature & Dew point at Standard and Selected Pressure Surface	27-28
„ B2.—Mean and Extreme values of The Freezing Level and The Tropopause; The Highest Wind Speed in The Upper Air	29
„ B3.—Number of Occurrences of Wind Direction Within Specified Ranges and The Mean Scalar Wind Speed at the Standard and Selected Pressure Surfaces	30-32

AGRO-METEOROLOGICAL DATA

Note : Agro-Meteorological Data for El Kasr are not included since the observations at that station were interrupted during the year 1969.

Annual review of Agro-meteorological stations	33-35
Table C1.—Air Temperature at 1½ Metres Above Ground	36
„ C2.—Extreme Values of Air Temperature at 1½ Metres Above Ground, Absolute Minimum Air Temperature at 5 cms Above Ground Over Different Fields	36
„ C3.—(Solar + Sky) Radiation, Duration of Bright Sunshine, Relative Humidity and Vapour Pressure at 1½ Metres Above Ground, Evaporation and Rainfall	36
„ C4.—Extreme Soil Temperature at Different Depths in Different Fields	37
„ C5.—Surface wind	38

FOREWORD

The "Annual Meteorological Report" for Egypt was issued regularly since the year 1900 by the Survey Department at Cairo. The Annual report of the year 1900 contained the daily, monthly and annual values of different meteorological elements at Abbasiya (Cairo) and other few climatological stations in Egypt and Sudan.

With the closing of Abbasiya Observatory as the Principal Meteorological Station in the year 1904 and replacing it by Helwan Observatory, it had been decided starting from the Annual Meteorological Report of 1904, to separate the Annual Meteorological Report into two independent parts, the first of which was dealing with the whole work of Helwan Observatory, while the second part included the daily, monthly and annual values of different meteorological elements at selected climatological and rainfall stations together with the River data.

Starting from the issue of 1941 the Annual Meteorological Report contained no more daily values but only monthly and annual values.

As from the issue of 1958 the Annual Meteorological Report took a new form. It started with a general annual review of weather together with twelve monthly summaries of weather conditions in Egypt. In addition, it included a new set of tables giving more detailed surface and upper air climatological data for selected stations. The

annual review of Agro-Meteorological station at Giza; the monthly and the annual values of routine observations made at the fields of the station were also included in the Annual Report. This annual review gave a brief summary of the characteristic features of the different meteorological and micro meteorological elements of the year ; more weight was given in this review to elements which are of interest to agriculturists. Moreover, the Annual Meteorological Report specified the different climatic districts in Egypt. It also contained explanatory notes about methods of observations of different meteorological elements ; instruments used in these observations, their exposure and methods of deriving daily, monthly and annual mean values and frequencies of different elements.

As from 1960, tables appearing in the Annual Meteorological Report have been totally revised and some new tables have been introduced to include more detailed climatological data.

As from 1964, the Annual Meteorological Report was again totally revised. The number of meteorological stations appearing in the Report have been concentrated in the main synoptic stations working mostly continuously 24 hours. In addition, climatological data included in the Report will be confined to the annual mean values, annual totals, annual frequencies and annual absolute values. More specific climatological data have to be requested from the Meteorological Authority.

Chairman (M. F. TAHA)

Board of Directors

Cairo, August 1972

INTRODUCTION AND EXPLANATION OF THE TABLES

For the purpose of this Annual Weather Report, the Arab Republic of Egypt is divided into six climatic districts as follows :

Number	District	Number	District
I	Mediterranean Area	IV	Upper Egypt
II	Lower Egypt	V	Western Desert
III	Cairo Area	VI	Red Sea Area

The data included in Tables A1, A2, A3, A4 and A5, are based on surface observations made at a representative selection of the basic network of synoptic stations. The data included in Tables B1, B2, B3 refer to Upper Air Observations. The data included in Tables, C1, C2, C3, C4 & C5, are based on observations taken at the Agro-Meteorological stations at Tahrir, Bahtim and Kharga. The observation fields at Tahrir, Bahtim and Kharga are considered for the moment as dry and bare fields. At Kharga Oasis, the observation field is of the size of about 4000—6000 square metres.

The soil characteristics of these fields are :

	TAHRIR	BAHTIM	KHARGA
Top soil type	Pure sand	Not available at present	Sandy loam granular Not-compact
Top soil depth	More than 3 metres	„	20 cms.
Sub soil type	Pure sand	„	Platey clay non-compact
Slope of ground and its direction	$\frac{1}{2}$ towards East & North	„	Flat (0-03%)
Level of Water table .	More than 5 Metres	„	More than 5 Metres

Except for the wind speed which is expressed in knots, the metric units are used throughout this report and are as follows :

- The atmospheric pressure is expressed in millibars (one millibar = 1000 dynes per square centimetre = The pressure due to 0.7501 millimetre of mercury at 0°C at latitude 45°).
- Air and soil temperatures in degrees celsius (°C).
- Relative humidity (%).
- Rainfall in millimetres.
- Snow depth in centimetres.
- Duration of bright sunshine in hours.
- Sky cover in octas.
- Evaporation in millimetres.
- Altitude of pressure surface in geopotential metres.
- Mean wind speed of the whole day, and of the day-time and the night-time intervals in metres per second.
- (Solar+Sky) radiation in gram-calories per centimetre square.
- Vapour Pressure in millimetres.

EXPLANATORY NOTES ON TABLES

SURFACE DATA

TABLE A 1.—Annual mean daily values of the Atmospheric Pressure, Air Temperature, Relative Humidity, Piche Evaporation and Total Bright Sunshine Duration.

This table gives the following data :

- The annual mean daily values of the M.S.L. Pressure and their deviations from the corresponding normal values.
- The annual mean values of maximum air temperature (A), minimum air temperature (B) and $\frac{A+B}{2}$ and their deviations from their corresponding normal values.
- The annual mean daily values of dry bulb temperature, wet bulb temperature and relative humidity and their deviations from their corresponding normal values.
- The total actual and the total possible durations of bright sunshine during the year; the percentage of the total actual with respect to the possible duration.
- The annual mean daily values of Piche Evaporation.

The annual mean daily values of the atmospheric pressure, air temperature, relative humidity & Piche evaporation are the arithmetic means of the corresponding monthly mean daily values during the year.

The monthly mean daily value of the atmospheric pressure corrected to Mean Sea Level (M.S.L.) is the arithmetic mean over the month of the corresponding daily hourly values or of the daily observations taken at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). The atmospheric pressure is measured by mercury barometers installed indoors. The M.S.L. Pressure is the barometer reading corrected for the height of the barometer cistern above or below the Mean Sea Level at the station. Corrections for index, temperature and latitude have been applied to the barometer readings before reduction to M.S.L. In case of stations which do not take some of these synoptic observations, the pressure for these hours is computed from the records of barographs placed indoors at the stations.

The monthly mean values of the maximum (A) and of the minimum (B) air temperatures are the arithmetic means of their corresponding daily values over the month. The maximum (mercury) and the minimum (alcohol) thermometers are freely exposed in the louvred screens with their bulbs at a height of 160 to 170 centimetres above the ground.

The monthly mean values of $\frac{A+B}{2}$, are computed from their corresponding daily calculated values over the month.

The monthly mean daily values of the dry and of the wet bulb air temperatures are the arithmetic means over the month of their corresponding daily hourly values or of their corresponding values at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). The dry and wet bulb thermometers used are of the mercury type and freely exposed in sloping double roofed louvred screens with their bulbs at a height 140-150 centimetres above the ground. In case of stations which do not take observations at some synoptic hours, values of the dry and wet bulb temperature for these synoptic hours are extracted from the records of recording dry & wet thermographs placed in the louvred screens at the stations.

The monthly mean daily values of the relative humidity are derived from the mean daily values during the month of the dry and wet bulb air temperatures using Jelinek's Psychrometer Taflen (Leibzig 1911). The mean daily values of the dry and wet bulb air temperatures are derived as in the last paragraph.

The monthly mean daily values of Piche evaporation are the arithmetic means over the month of its daily values. Evaporation measurements are taken once daily at 0600 U.T. and give the evaporation for the previous 24 hours. The evaporation readings are measured by a Piche tube freely exposed in sloping double roofed, louvred screens, the evaporation disc has an effective area of 10.1 centimetre square, white in colour and at a height of 140—150 centimetres above the ground.

The annual value of the actual duration and of the possible duration of bright sunshine is the sum of their corresponding monthly values during the year. In calculating the possible duration of sunshine for a given day, the period of cut off for that day caused by obstacles such as mountains, are eliminated from the possible duration with an ideal flat horizon. In case of stations where the record of a day or more is missing, the total actual duration is given between brackets and a note is added at the end of the table giving the actual number of records (days) used in summing up this total actual. In such cases the corresponding total possible duration is also given in brackets and it is the sum of the annual possible duration of the days of the available records. The duration of bright sunshine is measured by the Campbell-Stokes sunshine recorders which are suitably exposed.

TABLE A 2.—Maximum and Minimum Air Temperatures.

This table gives the following data ;

- The extreme values of the maximum and of the minimum air temperatures observed during the year and their dates of occurrences.
- The number of days during the year with maximum air temperatures above and with minimum air temperatures below, specified limits.
- The annual mean daily values of the grass minimum air temperatures and their deviations from the corresponding normal values.

Higher and lower limits of both maximum and minimum air temperatures during the year and their corresponding dates of occurrences are extracted from the daily readings of maximum (mercury) and minimum (alcohol) thermometers. These are included for actual occurrences up to three (last three dates) ; when exceeding three, the symbol* is added beside the last three dates.

The number of days during the year with maximum air temperatures above 25°C, 30°C, 35°C 40°C & 45°C and with minimum air temperatures below 10°C, 5°C, 0°C & — 5°C are included also in this table under separate columns.

The types and exposure of the maximum and of the minimum thermometers are as indicated in notes on table A 1.

The annual mean values of grass minimum temperatures are the arithmetic means over the year of the corresponding monthly mean values. The monthly mean values are the arithmetic means over the month of their corresponding daily values. The grass minimum temperature is measured by an ordinary minimum (alcohol) thermometer suitably exposed in the open air at the station field on special stand with its bulb at a height of 5 centimetres above ground just touching the grass tops if there is any. Grass minimum thermometer readings are taken daily on a routine base at 0600 U.T.

TABLE A 3.—Sky Cover and Rainfall

This table gives the following data :

— The annual mean values of the total sky cover at the principal synoptic hours of observations and of the daily total sky cover.

— The total amount of rainfall during the year and its deviation from the corresponding normal value.

— The maximum amount of rainfall in one day and its date of occurrence.

— The number of days with amounts of rainfall reaching or exceeding specified limits.

The annual mean value of the total sky cover at the principal synoptic hours (00, 06, 12 & 18 U.T.) and of the daily total sky cover is the arithmetic mean over the year of the corresponding monthly mean values. The monthly mean values of the total sky cover at the principal hours are computed from their corresponding daily routine values observed during the month. The monthly mean values of the daily total sky cover is the arithmetic mean over the month of the daily hourly values or of the daily observations taken at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). Sky cover is in octas.

The total annual rainfall is the sum of the total monthly rainfall during the year. The total monthly rainfall is the sum of the daily rainfall during the month. The maximum daily rainfall and the number of days with rain < 0.1 and equal or more than $0.1, 1, 5, 10, 25$ & 50 mm. are extracted from the routine daily rainfall totals during the year. The rainfall for a given day is the amount of rain which has fallen during the 24 hours commencing at 0600 U.T. of that day; when the amount of rain which has fallen is not large enough to be measured (less than 0.1 mm.) the term «Trace» is entered as (Tr.). The amount of rainfall measured includes the water equivalent of the rain, water which has frozen after falling and the water equivalent of solid precipitation such as hail if any. Dates of maximum rain in 24 hours are included for actual occurrences up to three (last three dates); when exceeding three, the symbol * is added besides the last three dates.

The amount of rainfall is normally measured by ordinary rain gauges. Some selected stations are also equipped with a recording type of rain gauge. The rim of both types of rain gauges are at a height of 90—100 cms above the ground.

TABLE A 4.—Annual Frequency of Occurrence of Miscellaneous Weather Phenomena.

This table gives the number of days of occurrence of rain, snow, ice pellets, hail, frost, thunderstorm, mist, fog, haze, thick haze, dust or sandrising, dust or sandstorm, gale, clear sky & cloudy sky. Except for rain (see notes on table A 3) the days of occurrence of these weather phenomena are those days during which the phenomenon has occurred at any time between 2200 and 2200 U.T. for stations working 24 hours, but for stations working less, this table gives the annual frequency of occurrence of these phenomena during hours of observations only.

In compiling this table, the terminology and definitions of these different weather phenomena are as follows.

— A day of rain is the day during which the total amount of rainfall is 0.1 millimetre or more.

— A day of snow is the day during which snow or snow flakes or snow showers is or are observed even if it is or (they are) so small in quantity as to yield no measurable amounts of precipitation in the rain-gauge.

— A day of ice pellets is the day during which ice pellets are observed even if they are so small in quantity as to yield no measurable amounts of precipitation in the rain-gauge.

— A day of hail is the day during which either one or more of the following types of precipitation is or are observed even if they are so small in quantity as to yield no measurable precipitation in the rain-gauge :

- Soft hail
- Small hail
- Hail stone

— A day of frost is the day during which frost is observed at the station.

— A day of thunderstorm is the day during which thunder is heard at the station whether lightning is seen or not. A day on which lightning is seen but thunder is not heard at the station is not counted as a day of thunderstorm.

— A day of mist is the day during which the surface horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to mist.

— A day of fog is the day during which the surface horizontal visibility at the station has deteriorated and fell below 1000 metres due to fog.

— A day of haze is the day during which the horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to haze

— A day of thick haze is the day during which the horizontal visibility at the station has deteriorated and fell below 1000 metres due to thick haze.

— A day of dust or sandrising is the day during which the horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to dust or sandrising.

— A day of dust or sandstorm is the day during which the horizontal visibility at the station has deteriorated and fell below 1000 metres due to dust or sandstorms.

— A day of gale is the day during which the mean surface wind speed reached or exceeded 34 knots at the station for at least 10 minutes.

— A day of clear sky is the day on which the mean cloud amount at the station is less than $\frac{2}{8}$.

— A day of cloudy sky is the day on which the mean cloud amount at the station is $\frac{6}{8}$ or more.

As regards the last two items above, the mean cloud amount for a day is the mean of the 24 hours, the 8 synoptic hours or the 4 main synoptic hours of cloud observations according to the number of the routine observations taken at the station.

TABLE A 5.—Annual number in hours of occurrences of concurrent surface wind speed and direction recorded within specified ranges.

This table gives the annual number in hours of the following :

- Calm winds,
- variable winds,
- unrecorded winds,
- simultaneous occurrences of surface wind satisfying the specified ranges of speed and direction.
- surface wind blowing from specified ranges of direction irrespective of their speed,
- surface wind satisfying specified ranges of speed irrespective of their direction.

The annual number in hours of all elements included in this table is the sum of the corresponding monthly values during the year.

The elements used in preparing this table are the mean hourly values of the surface wind speed and the corresponding mean hourly values of direction taken from the daily records of the surface wind instruments installed at the station. These mean hourly values are extracted for every hour of each day of the year and they refer to a period of 60 minutes centred at the hour.

The number in hours of occurrences of the surface wind falling within the ranges of speed and direction indicated in the table is the number of cases when the mean hourly values of the surface wind as defined have satisfied these ranges.

The number in hours of "variable" winds is the number of cases where the surface wind showed no definite direction over the period of the 60 minutes centred at the hour or when the wind vane was sticking over that period due to the lightness of the wind and not responding to the variation in wind direction ; in such cases the mean wind speed over this period is normally less than 5 knots. The number in hours of "calm" winds is the number of cases where the surface wind has a mean speed of less than one knot over that period, whatever the mean wind direction over the same period is. The number in hours during which the recording instrument failed to record over the whole year is given under a separate column.

The instruments used for recording the surface wind are of the Dines Pressure Tube Anemograph.

This table follows the general lines of Model B of chapter 12 part IV of the WMO Technical Regulations 1959. The ranges of wind speed are (1-10), (11-27), (28-47) knots and 48 knots or more ; the ranges for wind direction are twelve ranges of 30° each, beginning with the range (345°-014°) as being the true north.

UPPER AIR DATA

TABLE B 1.—Annual climatological data of pressure, temperature and dew point at the surface of the station, the standard and the selected pressure surfaces.

The routine upper air observations are taken at 0000 & 1200 UT, a separate table of this type is prepared for each hour.

This table follows the general lines recommended by the Commission for Climatology of the World Meteorological Organisation REC. 34 (CCL - 1), it gives the following data for the hour of observation indicated at the table :

— The number of cases (N) the height of each of the pressure surfaces indicated in the table has been attained during the year, and the number of cases the temperature and dew point at these pressure surfaces have been observed.

— The annual mean values of the atmospheric pressure corrected to the ground level of the station and its highest and lowest values during the year.

— The annual mean values of dew point at the surface.

— The annual mean, the highest and the lowest values of the altitude of each of the pressure surfaces.

— The annual mean, the highest and the lowest values of air temperature at each of the pressure surfaces.

— The annual mean value of dew point at each of the pressure surfaces.

Mean annual values are computed as the arithmetic mean of the twelve monthly mean values.

The monthly mean values are computed as the arithmetic mean of all daily values. Whenever, it is not possible to obtain a complete set of daily values, a useful monthly mean value may be obtained as the mean of available values, taking in consideration ; (a) number of missing observations not more than 10, and (b) there in no continuous period of 5 days without an assigned value.

The instruments used are of the radiosonde modulating frequency recording type ; no corrections for radiation are applied.

The altitudes are given in geopotential metres above mean sea level, temperatures and dew points in degrees celsius.(°C).

TABLE B 2.—Annual mean and extreme values of the freezing level and the first tropopause ; the highest wind speed in the upper air.

The routine upper air observations are taken at 0000 & 1200 U.T. ; a separate table of this type is prepared for each hour as indicated in notes on table B₁. This table is based on wind observations taken by the SCR — 658 or the Metox radiotheodolites working simultaneously with the radiosonde observations. The types of radiosonde instruments used are given in notes to table B₁.

This table gives the following data for each hour of observation :

— The annual mean values of the altitude, pressure and dew point of the freezing level together with the number of observations (N) taken during the year for each element ; the altitudes and months of occurrence, pressures and dew points of the highest and lowest freezing levels observed during the year.

— The annual mean values of altitude, pressure and temperature of the first tropopause together with the number of observations taken during the year for each element, the altitudes and months of occurrences, pressures and temperatures of the highest and lowest first tropopauses observed during the year.

— The direction and speed of the highest wind speed, the altitude, month of occurrence and pressure at which this speed is observed.

The annual mean values of the altitudes of the freezing level and of the first tropopause, and the annual mean values of the pressure and of the dew point or temperature at each of these levels are the arithmetic means of the corresponding monthly mean values. The first tropopause is determined in accordance with the definition adopted by the Executive Committee of the World Meteorological Organization Resolution 21 (EC-IX).

Altitudes are given in geopotential metres above mean sea level, temperatures and dew points in degrees celsius, wind direction in degrees east of the true north on the scale (000-360°) and wind speed in Knots.

Table B 3 — Annual Frequency of Occurrences of Wind Direction within Specified Ranges and The Mean Scalar Wind Speed at The Surface of The Station, The Standard and Selected Pressure Surfaces.

The routine upper air observations are taken at 0000 and 1200 U.T. A separate table of this type is used for each station.

This table, as in the case of table B 1, follows the genral lines recommended by the Commission for Climatology of the World Meteorological Organisation Rec 34 (CCL-1) ; the ranges of wind direction used are twelve ranges of 30° each beginning with the range (345° — 014°) as being the true north. This table gives for each hour of observation the following data of wind analysis at the surface, standard pressure surfaces and a number of selected pressure surfaces.

- The number of cases (N) the wind has been observed from the specified ranges of direction.
- The mean scalar speeds (ffm) of winds blowing from the specified ranges of wind direction.
- The number of cases of calm winds.
- The total number of cases (TN) the wind has been observed during the year.
- The mean scalar speeds of winds blowing from all directions.

The mean scalar wind speed(ffm) of winds blowing from each range of direction at a given pressure surface is the arithmetic mean of the ocrresponding monthly mean values of wind speeds. The term "Calm" is used to denote wind speed of less than one knot.

AGRO-METEOROLOGICAL DATA

Annual Review of Agro-Meteorological Stations.

The annual review includes abridged and summarized report on the characteristic features of the different meteorological and micro-meteorological elements. More weight is given in this review to those elements which are of interest to agriculturists.

TABLE C1.—Annual Air Temperature at 1½ metres above Ground

This table gives the following data :

- The annual mean values of the maximum and of the minimum air temperatures.
- Tha annual mean values of the day, the night time and the day time of air temperatures.
- The annual mean values of the duration of air temperatures above specified values.

The annual mean values of the maximum, minimum, night-time mean, day-time mean and mean of day of air temperatures are the arithmetic mean of the corresponding monthly mean values. The monthly mean values of these elements are the arithmetic mean of the corresponding mean daily values.

The mean air temperature of a day is the mean of the eight values of the dry bulb temperature occurring at each of the principal and secondary observation hours, the value at 0000, 0300 & 2100 U.T. being extracted from the record of the dry bulb thermometer of a mercury in steel hygrograph, except at Kharga where they are obtained from visual readings.

The night-time mean temperature of a day is the mean temperature for the period from sunset of the previous day to sunrise of the same day. The day-time mean temperature refers to the period from sunrise to sunset of the same day. Both night-time and day-time mean temperatures are computed from empirical formulae, which may vary from month to month but are common for all centres. These formulae were found by trial comparison with true means of the year 1966. The errors were never permitted to reach a whole degree, and usually stayed equal to or lower than 0.5°C.

The duration of air temperatures above a specified limit of temperature is obtained graphically from the same recording charts, daily to the nearest whole hour.

The maximum (mercury), the minimum (alcohol) and the dry bulb (mercury ventilated) thermometers are freely exposed in louvered Stevenson screens of the Egyptian type with their bulbs at a height of 190 - 195 centimetres above ground for the maximum and minimum thermometers, and 170 cms approximately for the dry bulb thermometer ; the recording thermometer used is of the bi-metallic type and is exposed in a similar screen ; the height of the bi-metallic piece is 165 centimetres approximately above the ground.

TABLE C 2.—Annual Extreme values of Maximum and Minimum air temperatures at $1\frac{1}{2}$ metres above ground, Absolute Minimum air temperature at 5 cms. above ground in different fields,

The extreme values (highest and lowest) of maximum and minimum air temperatures at $1\frac{1}{2}$ metres above ground, and the absolute values (lowest) of minimum air temperatures at 5 cms. above ground in dry fields are extracted from their corresponding daily routine values. Dates of occurrences are included in separate columns beside the corresponding extreme values.

The thermometers used for minimum air temperature at 5 cm. above ground are of the ordinary minimum type (alcohol) with the bulbs screened with small separate screens of horizontal 5 cm. length and 2 cm. diameter metal tubing painted white outside and black inside, and centered on the thermometer bulbs.

TABLE C 3.—Annual values of (Solar + sky) Radiation, Duration of bright sunshine, Relative humidity, Vapour pressure at $1\frac{1}{2}$ metres above ground, Evaporation and Rainfall.

This table gives the following data :

- The annual mean values of the (solar + sky) radiation.
- The annual total actual and total possible durations of bright sunshine, the percentage of the total actual with respect to the total possible duration.
- The annual mean of the day of relative humidity, the mean of relative humidity at 1200 U.T. and the lowest value of relative humidity during the year.
- The annual mean of the day of vapour pressure and the vapour pressure at 1200 U.T., the highest and lowest values of vapour pressure during the year.
- The annual mean values of the evaporation taken by the Piche tube and by class "A" evaporation pan.
- The annual total rainfall, and the maximum rainfall in one day during the year.

The annual mean value of the (solar+sky) radiation is the arithmetic mean of the monthly mean values. The monthly mean value is the arithmetic mean of the daily values. The (solar+sky) radiation is obtained, daily from the records of a Robitzsch actinograph ; the Robitzsch values at Bahtim and Tahrir are regularly compared with the records of an Eppley pyrliometer. The sensitive elements of the Robitzsch actinograph and of the Eppley pyrliometer are at 100 cms. approximately above the ground.

The annual value of the total actual and total possible duration of bright sunshine is the sum of the corresponding daily values during the year. The types of instruments used for the measurement of the duration of bright sunshine, their exposure and the calculation of the total possible duration values are as given in notes on table A1.

The annual mean relative humidity of the day and at 1200 U.T., mean vapour pressure of the day and at 1200 U.T. and mean evaporation are the arithmetic mean of the corresponding monthly mean values.

The relative humidity and vapour pressure values at a certain hour are derived from the readings of ventilated dry and wet bulb mercury thermometers freely exposed in the screen using the Aspirations Psychrometer Tafeln of the Deutschen Wetterdienst 1955. The height of the bulbs is 170 cms approximately above the ground.

The mean relative humidity or vapour pressure for a given day is obtained from the eight principal and secondary observation values which are extracted from the readings of the dry and wet bulb thermometers, the values at 0000, 0300, and 2100 U.T. being extracted from the records of the mercury in steel hygrograph except at Kharga where these values are obtained from visual readings of the dry and wet bulb thermometers.

The monthly mean values of the relative humidity & vapour pressure are the arithmetic means of the corresponding mean daily values during the month. The lowest values of the relative humidity and its date of occurrence are obtained from the records of a hair hygrograph exposed in the screen, the height of the hair is 170 centimeters approximately above the ground.

The absolute maximum and minimum values of vapour pressure during the year are extracted from the values of the eight principal and secondary observations.

Evaporation measurements are taken once daily at 0600 U.T. from a Piche tube and also a class "A" evaporation pan and give the evaporation for the previous 24 hours. The Piche tube is installed in the screen with the dry bulb, maximum and minimum thermometers; the colour and effective area of the evaporation disc are as given in the notes on table A1. The class "A" evaporation pan is of the type recommended by the Commission of Instruments and Methods of Observation of the World Meteorological Organization Rec 42 (CIMO-56); it is of a cylindrical shape, 25.4 centimeters deep, 120.6 centimeters in diameter (inside dimensions). The pan is freely exposed in the open air with its rim at a height of 41 centimeters above ground away from obstacles such as buildings or trees.

The types of instruments used for measuring the amount of rainfall, their exposure and the evaluation of these amounts are given in the notes on table A3.

TABLE C 4.—Extreme Soil Temperature at Different Depths in Different Fields (cms).

The highest and lowest values of soil temperatures at the selected depths are extracted from their corresponding daily routine values.

The soil temperature readings are taken in the dry fields at the specified depths ranging from 2 cms to 300 cms in each field as indicated in the table. These readings are taken regularly during the period from 0600 to 1800 U.T. according to the following schedule, except at Kharga where the observations are as appropriate but extend in the period between 1800 and 0600 U.T.

- at 0600 U.T. and every three hours for the 2, 5 and 10 cms depths.
- at 0600 U.T. and every six hours for the 20 and 50 cms depths.
- at 1200 U.T. for the 100 and 200 cms. depths.
- at 0900 U.T. once every 3 days for the 300 cms depth.

The thermometers used are of the Fuess or the Fridrich type.

TABLE C 5.—Surface Wind

This table gives the following data :

— The annual mean of the day, the night-time and the day-time mean of wind speeds.

— The annual number of days with surface wind speed at 10 metres reaching or exceeding specified limits for at least 5 minutes ; the highest gust recorded during the year and its date of occurrence.

The annual daily mean, the night-time mean and the day-time mean of the surface wind speed are the arithmetic mean of monthly mean daily values. The monthly mean values of these elements are the arithmetic mean of the mean daily values. The mean wind speed of the day is computed for the period of 24 hours from 1800 U.T. of the previous day. The night-time mean wind speed is calculated from the total run of air during the period 1800 U.T. of the previous day to 0600 U.T. of that day. The day-time mean is similarly computed for the period 0600 U.T. to 1800 U.T. of the same day.

The type of the wind instrument used is of the run counter of the Lambrecht type, the cups of which are at $1\frac{1}{2}$ meters above the ground.

The annual number of days with surface wind speed reaching or exceeding specified values of velocities (10, 15, 20, 25, 30, 35 & 40 Knots) for at least 5 minutes at any time between 2200 & 2200 U.T. irrespective of its direction are extracted from the daily routine analysis of the surface wind records during the whole year. The daily records of the Dine Pressure Tube Anemograph are used. The highest gust refers to the highest excursion made by the velocity pen on the records during the whole year. The head of the instrument is at a height of 10 meters above ground level.

LIST OF STATIONS APPEARING IN THE REPORT — SYNOPTIC AND CLIMATOLOGICAL STATIONS
YEAR 1969

District	Station	Index number IIIII	Latitude °N	Longitude °N	Elevation of the ground in metres (H or Ha)	Altitude of the station in metres (Hp)	Altitude of the baro- meter cistern in metres	Height of wind recording instruments (metres)		Synoptic observations								Hourly observations (H) Half hourly observ. (h) (9000-24000)	Upper air observations P (Pilot Balloon) W (Radio Wind) R (Radio Sonde)				Remarks
								Above building	Above ground	00	03	06	09	12	15	18	21		00	06	12	18	
Mediterranean	Sallum	62 300	31 32	25 11	4.0	6.0	5.2	10	15	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Mersa Matruh (A)	306	31 20	27 13	28.3	30.0	30.0	8	15	x	x	x	x	x	x	x	x	H	RW	W	RW	W	
	Alexandria . . (A)	318	31 12	29 57	—3.4	7.0	6.8	10	18	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Port Said . . . (A)	333	31 17	32 14	1.9	6.1	6.1	10	19	x	x	x	x	x	x	x	x	H	P	—	P	—	
	El Arish	336	31 07	33 45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ghazza	338	31 30	34 27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Lower Egypt	Tanta	348	30 47	31 00	14.0	14.8	15.4	10	14	x	x	x	x	x	x	x	x	H	—	—	—	—	
Cairo Area	Cairo	366	30 08	31 34	94.7	74.5	74.0	14	18	x	x	x	x	x	x	x	x	h	—	—	—	—	
	Helwan	378	29 52	31 20	139.3	139.3	149.7	—	10	x	x	x	x	x	x	x	x	—	RW	W	RW	W	
Upper Egypt	Fayoum	381	29 18	30 51	22.0	23.3	23.2	10	14	—	—	x	x	x	x	x	—	H	—	—	—	—	
	Minya (A)	387	28 05	30 44	29.0	40.0	44.2	7	10	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Assyout	393	27 11	31 06	71.0	69.6	69.5	15	20	x	x	x	x	x	x	x	x	H	—	—	—	—	
	Luxor (A)	405	25 40	32 42	94.9	88.5	88.4	7	15	x	x	x	x	x	x	x	x	H	—	—	—	—	
	Aswan (A)	414	23 58	32 47	200.0	193.5	200.0	10	14	x	x	x	x	x	x	x	x	H	RW	W	RW	W	
Western Desert	Siwa	417	29 12	25 29	—15.0	—13.5	—13.3	10	17	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Bahariya	420	28 20	28 54	128.0	129.5	129.6	—	—	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Farafra	423	27 03	27 58	90.0	91.8	92.1	—	—	—	—	x	x	x	x	x	—	H	—	—	P	—	
	Dakhla	432	25 29	29 00	110.0	111.5	111.5	10	15	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Kharga	435	25 27	30 32	77.8	72.8	78.8	10	15	x	x	x	x	x	x	x	x	H	P	—	P	—	
Red Sea	Tor	459	28 14	33 37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Hurghada	462	27 17	33 46	1.0	2.8	2.8	8	12	x	x	x	x	x	x	x	x	H	—	—	P	—	
	Quseir	465	26 08	34 18	8.0	11.3	11.3	12	15	x	x	x	x	x	x	x	x	H	—	—	—	—	

GENERAL SUMMARY OF WEATHER CONDITIONS FOR THE YEAR 1969

WEATHER

The prevailing weather in Winter was generally cold in January, but characterized by alternative warm spells and light cold waves in rest of the season. In Spring weather was changeable, intervened by variant khamsin heat waves generally of short durations. Stable weather prevailed in Summer, generally mild in the north and excessively hot in the south. In Autumn weather was generally mild in the north and warm in the south, intervened by few heat waves.

RAINFALL AND THUNDERSTORMS

Light to moderate rain fell over the northern parts and extended in few days to scattered localities in the central and southern parts during Winter and the transitions.

The daily rainfall was heavy and associated with thunderstorms in few days. During October in particular, heavy rain caused floods which overrun scattered places in Lower Egypt district, Giza, Beni-Suef & Aswan Provinces. It is worthy to mention that the daily rainfall reached a record during April at Sallum (27.0 mms) on the 14th, during May at Mersa Matruh (20.1 mm) on the 11th, during August at Luxor (0.5 mm) on the 30th, during October at Ras-El-Hikma (45.4 mm) on the 8th, Bah-tim (50.5 mm) on the 19th, Damanhour (39.2 mm) on the 8th and at Cairo (A) (13.8 mm) on the 9th.

The monthly rainfall was generally above normal in January, Spring season & October, and generally below normal otherwise.

SURFACE WIND

The prevailing surface winds were generally light to moderate N/NW, though NE winds were of less frequency. Winds changed to SWly and were fresh or strong in association with the transits of secondary depressions or Mediterranean troughs, mostly in the northern parts.

Calms were frequent in scattered localities in late evening and early morning intervals.

Gales were reported in few scattered localities during few days; its annual frequency ranged generally between 1 and 5 days.

MISCELLANEOUS WEATHER PHENOMENA

The transits of secondary depressions or Mediterranean troughs through the country was associated with rising sand over scattered places and with few occasions of local sandstorms.

The frequency of occurrence of sandstorms was maximum (12 days) at Aswan; otherwise it ranged between 1 & 8 days, and even in few localities no gales were reported the whole year.

Early morning mist or fog developed in large occasions in Lower Egypt & Cairo districts and with less frequency in the Mediterranean and north of Upper Egypt districts; and was negligible south of Assiout area.

The annual frequency of occurrence of fog was 36 days at Mansoura, 24 days at Inshas, 21 days at Alexandria and Cairo (A); otherwise its frequency ranged between 1 & 16 days.

THE WEATHER DURING THE YEAR 1969

JANUARY

The prevailing weather during this month was generally cold in the northern and central parts, and rather cold in the southern parts. Weather was remarkably cold night time, especially in the Western Desert and north of Upper Egypt areas, where minimum temperature approached 0°C during many nights. Three pronounced cold waves prevailed most days of this month; the third cold wave was the most intense and longest; it prevailed from the 19th till the end of the month. The cold waves were separated by short periods of mild weather round the 2nd, 11th & 17th.

Light to moderate rain fell over the northern parts during many days of this month, and extended southwards during few days. Rain was locally heavy and associated with thunderstorms over the Mediterranean district, mainly during the last cold wave.

Rising sand occurred over scattered parts, mostly in association with frontal passages round the 4th, 12th, 18th, 28th. Early morning mist and fog developed during few days over scattered places in Delta, Canal & Cairo areas and north of Upper Egypt district.

The prevailing winds in the northern parts of the Republic were generally light to moderate SW ly; they changed to NW ly during few days, mainly after the passage of the Mediterranean troughs through Egypt. In upper Egypt and Western Desert district light to moderate W,NW winds prevailed, though SW ly winds blew during several days.

The Red Sea area was characterized by the prevalence of light to moderate N,NE winds most days of the month.

Winds became fresh to strong during several days by the passage of Mediterranean troughs and mainly during the period (17th - 23rd). On the other hand calms were frequent most of night and early morning intervals.

Gales were reported at Hurghada on the 29th.

FEBRUARY

Weather during this month was much changeable in temperature. The month was characterized by four pronounced warm spells round the periods (2nd - 6th), (10th - 11th), (14th - 17th) & (22nd - 28th). The third and fourth warm spells were the most pronounced. During the rest periods of the month, weather was rather cold in the northern parts, and mild in the middle and southern parts.

Light rain fell over the Mediterranean district during the period (7th - 9th) and round the 22nd. It extended southwards to few scattered places on the 22nd only.

Rising sand blew over scattered places by the passage of cold fronts round the 7th, 12th, 17th & 26th. Early morning mist and fog developed during several days over scattered places in Delta, Canal & Cairo areas and in northern parts of Upper Egypt district.

The prevailing winds most days of this month were generally light to moderate and blew from directions between NE & NW. Winds became fresh to strong in association with the transits of Mediterranean troughs through East Mediterranean and changed to SW ly mainly in north of the Republic. On the other hand, calms were frequent most of night and early morning intervals.

Gales were reported at Sidi Barrani on the 11th.

MARCH

Weather during this month was markedly changeable, characterized in particular by three pronounced khamsin heat waves round the periods (1st - 7th), (15th - 17th) and (24th - 31st). The break down of the first and second heat waves was associated with appreciable drop in temperature and followed by weather of mild temperature.

Light rain fell over north of the Republic mainly during the second mild period. Rain was locally heavy over scattered parts in the Mediterranean on the 20th.

Rising sand occurred during many days, the highest frequency was reported in the Red Sea district. Widespread sandstorms blew between the 17th and 19th.

As a result of the frequent transit of pressure disturbances through the country during this month, surface wind showed marked changeability. Surface winds blew generally from easterly direction in advance of the travelling khamsin secondaries and Mediterranean troughs, then they blew from south - westerly direction during their passages, and from north - westerly in their rears. Winds were mostly light to moderate, though they became fresh to strong during many days of the month, mainly in the Mediterranean, Western Desert and Red Sea districts. On the other hand, calms were frequent most of night and early morning intervals.

Gales were reported at M. Matruh on the 16th, Cairo on the 17th & 18th, Assyout on the 17th & 19th, Aswan on the 19th & 21st & at Hurghada on the 7th, 10th & 19th.

APRIL

The prevailing weather most days of this month was rather cold in the northern parts, mild in the central parts and rather hot in the southern parts. The month was intervened by four short khamsin heat waves round the 9th, 15th, 20th and 24th. These heat waves were of light intensity, apart from the first heat wave which was pronounced over Upper Egypt area in particular.

Light rain was reported over scattered parts in the Republic during the period (10th - 17th).

It is worthy to mention that the daily rainfall reached a record at Sallum (27.0 mms) on the 14th.

Rising sand occurred during many days of the month over scattered places in the Western Desert, Upper Egypt and Red Sea districts.

The prevailing winds during this month blew generally from directions between NW, NE and changed to SW by the passage of khamsin depressions. Winds were light to moderate in general, they became fresh to strong during several days mainly over the Mediterranean and Red Sea districts.

Gales were reported at Aswan on the 1st, 9th, 12th, & 15th, and at Hurghada on the 1st & 12th.

MAY

The prevailing weather during this month was moderately changeable with respect to temperature. The month was mainly characterized by four khamsin heat waves of variant intensity and of short duration in north of the Republic and moderate duration in the south with their peaks round the 1st, 8th, 22nd, & 31st. The break down of these heat waves was followed by appreciable drop in temperature mainly during the two periods (2nd - 6th) and (10th - 16th). The second period was characterized by scattered light rain in general over Mediterranean district which extended sometimes to few localities inland.

It is worthy to mention that the daily rainfall reached a record at Mersa Matruh (20.1 mms) on the 11th.

Rising sand blew during several days over scattered parts, mainly in Upper Egypt and Western Desert districts. Early morning mist developed during few days over scattered localities in Delta, Canal and Cairo areas.

The prevailing winds during this month blew mostly between NE & NW directions, and were generally light to moderate. They became fresh to strong during several days over scattered parts mainly in the Mediterranean, Red Sea and Western Desert districts.

JUNE

The prevailing weather this month was characterized by five heat waves two of which were excessive with peaks round 8th & 15th. In particular the third heat wave was of rather long duration and prevailed from the 11th till the 15th. The heat waves were separated by short mild periods.

Light rising sand blew during several days over scattered places in the Western Desert, Upper Egypt and Red Sea districts.

The prevailing winds during this month were light to moderate in general and blew from directions between NW, NE. Winds became fresh to strong during several days over scattered places mainly in the Western Desert, Upper Egypt and Red Sea districts.

JULY

The prevailing weather during this month was generally of the mild summer type in north of the Republic and hot in the southern parts. Two light heat waves were experienced round the periods (6th — 8th) and (10th — 12th) during which weather was hot in north of the Republic and excessively hot in the south.

Apart from local rising sand several days in the Western Desert and Red Sea districts, and early morning mist many days over scattered localities in Delta and Cairo areas, no weather of important significance was experienced.

The prevailing winds during this month were generally light to moderate and blew from directions between NW, NE. Winds became fresh to strong during several days over few scattered places mainly in the Western Desert and Red Sea districts.

Gales were reported at Hurghada on the 14th.

AUGUST

The prevailing weather during this month was generally of the mild summer type in the northern parts, normal summer weather in the central parts and excessively hot in the southern parts. Three variant heat waves were experienced round the 4th, (15th — 20th) and (26th — 31st) respectively. The first heat wave was pronounced in the central parts and the third heat wave was remarkably excessive in the southern parts, otherwise the waves were of light intensity. The break down of these heat waves was followed by periods of mild summer weather particularly during the second week of the month.

It is worthy to mention that 0.5 mm, of rain fell over Luxor on the 30th, which is a record.

The important weather phenomena experienced during this month were the frequent rising sand during several days over the Western Desert and Red Sea.

Light to moderate NE to NW winds prevailed most days of this month in general. Winds became fresh to strong during many days of the month over scattered places in the Western Desert and Red Sea districts.

SEPTEMBER

The prevailing weather during this month was generally mild in the northern parts, rather hot in the middle parts and remarkably hot in the southern parts. Three variant heat waves prevailed most days of the month and were mainly pronounced in land areas. The third heat wave was the most pronounced and prevailed most of the second half of the month. The break down of the heat waves was followed by short mild periods.

The month was rainless, apart from 3 mms. over Sallum on the 30th and 0.8 mms over Sidi Barrani on the 30th.

Rising sand blew during several days over scattered places mainly in the Western Desert and Red Sea districts. Scattered early morning mist developed during several days over Lower Egypt and Cairo areas.

The prevailing winds during this month were generally light to moderate and blew from directions between NW and NE. They became fresh to strong many days of the month over scattered places in the Western Desert and Red Sea districts.

Gales were reported at Dakhla on the 24th.

OCTOBER

The prevailing weather during this month was generally mild in the northern and middle parts, rather hot in the southern parts. Three variant heat waves were experienced round the periods (1st — 7th), (18th — 19th) and (26th — 28th) and were mainly pronounced in land areas.

The month was characterized by two distinct rainy periods, (3rd — 10th) and (17th — 26th), during which rain of variant amounts fell over many parts of the Republic, and was associated at times with scattered lightning and thunderstorms. Rain was occasionally heavy causing floods between the (7th and 10th) over scattered parts in Lower Egypt area, Giza, Beni Suef and Aswan provinces.

It is worthy to mention that the daily rainfall reached a record at Ras-El-Hikma (45.4 mms) on the 8th, Bahtim (50.5 mms) on the 19th, Damanhour (39.2 mms) on the 8th and at Cairo (A) (13.8 mms) on the 9th.

Light to moderate N-NW winds prevailed most days of this month in general. They became fresh to strong during few days over scattered parts mainly in the Western Desert and Red Sea districts.

NOVEMBER

The prevailing weather during this month was generally mild in the northern and middle parts, and warm in the southern parts.

Weather was almost fine with the exception of few days of light rain over scattered localities in the northern districts. Rain was locally heavy over Mersa Matruh on the 1st and Alexandria on the 8th.

Early morning mist and fog developed during several days over scattered parts in Delta, Cairo and north of Upper Egypt district.

Light to moderate N-NW winds prevailed over the Republic most days of this month. Winds became fresh to strong during several days over few scattered localities mainly in the Red Sea and Western Desert districts.

Cairo, August 1972

DECEMBER

The prevailing weather during this month was generally rather cold with light and subnormal rainfall in the northern parts of the Republic. In the middle and southern parts, weather was generally dry and mild day-time but cool night-time. Four cold waves of light intensity prevailed most of the month; and were preceded by short rather warm spells round the periods (1st — 3rd), (9th — 12th), (20th — 21st) and (27th — 29th). The first and second warm spells were the most pronounced, mainly in land areas.

Light rising sand occurred during several days over scattered parts in north of the Republic, mainly over west of the Mediterranean coast. Early morning mist and fog developed during several days over scattered localities in Delta and north of Upper Egypt district.

Surface winds during this month were generally light to moderate W-SW in the northern parts, Nly in the middle and southern parts. Winds become fresh to strong during several days over scattered localities, mainly over west of the Mediterranean coast.

Chairman (M. F. TAHA)

Board of Directors

SURFACE DATA

**Table A 1.—ANNUAL VALUES OF THE ATMOSPHERIC PRESSURE, AIR TEMPERATURE,
RELATIVE HUMIDITY, BRIGHT SUNSHINE DURATION & PICHE EVAPORATION
YEAR — 1969**

STATION	Atmospheric Pressure (mbs) M.S.L		Air Temperature °C									Relative Humidity %		Bright Sunshine Duration (Hours)			Piche Evaporation mms. Mean
			Maximum		Minimum		$\frac{A+B}{2}$	Dry Bulb		Wet Bulb							
	Mean	D.F. Normal or Average	(A) Mean	D.F. Normal or Average	(B) Mean	D.F. Normal or Average		Mean	D.F Normal or Average	Mean	D.F Normal or Average						
												Mean	D.F Normal or Average	Total Actual	Total Possible	%	
Sallum	1013.3	—1.3	25.1	—0.2	16.5	+0.9	20.8	20.3	—0.1	15.7	—0.2	60	0	—	—	—	7.5
Mersa Matruh (A)	1014.4	—0.3	24.3	0.0	14.9	+0.5	19.6	19.2	—0.1	16.0	+0.3	70	+ 3	—	—	—	6.4
Alexandria . . (A)	1013.8	—0.3	25.0	0.0	15.7	—0.1	20.4	20.2	—0.1	16.6	—0.2	67	+ 2	(3404.4)	(4432.9)	(77)	5.9
Port Said . . (A)	1012.9	—0.7	24.4	—0.2	18.2	—0.3	21.3	20.9	—0.2	17.6	—0.2	71	+ 1	—	—	—	6.6
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ghazsa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	1013.5	—0.4	27.6	—0.4	14.2	+1.2	20.9	20.2	+0.1	16.0	+0.2	63	+ 1	—	—	—	4.9
Cairo (A)	1013.2	—0.7	28.0	—0.1	15.9	+0.4	22.0	21.6	+0.1	16.0	0.0	53	— 1	—	—	—	13.8
Fayoum	—	—	30.2	+0.7	14.7	+0.1	22.0	22.1	+0.2	16.1	+0.5	52	+ 3	—	—	—	6.6
Minya (A)	1012.6	—0.7	30.1	+0.3	13.6	+0.4	21.8	21.6	+0.4	15.3	+0.3	49	— 1	3675.3	4438.3	83	10.9
Assyout . . . (A)	1012.3	—0.6	30.8	+0.3	15.7	+0.3	24.1	23.0	0.0	15.1	+0.6	41	+ 4	—	—	—	15.4
Luxor (A)	1010.9	—0.3	34.6	+1.2	16.3	+0.7	25.3	25.3	+0.8	16.1	+0.5	35	0	—	—	—	9.7
Aswan (A)	1010.2	—0.6	35.1	+0.9	18.6	+1.1	26.7	26.7	+0.6	14.7	+0.6	22	+ 2	—	—	—	23.1
Siwa	1013.2	—1.4	30.0	+0.2	14.6	+1.5	22.3	22.2	+0.5	14.4	+0.3	38	— 2	—	—	—	12.3
Bahariya	1013.2	—0.4	30.5	+0.9	14.9	+1.3	22.7	22.6	+0.6	14.5	+0.1	38	— 2	—	—	—	9.7
Farafra	—	—	30.6	+0.5	14.1	+0.6	22.4	—	—	—	—	—	—	—	—	—	14.4
Dakhla	1013.3	+0.7	32.0	+0.6	14.5	—0.2	23.2	23.3	+0.4	13.7	+0.6	30	+ 2	—	—	—	17.0
Kharga	1011.8	—1.0	32.9	+0.7	16.8	+1.0	24.9	25.0	+1.0	14.2	0.0	30	— 2	(3774.5)	(4400.0)	(88)	19.1
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	1010.6	—0.5	28.3	+1.0	18.6	+0.9	23.4	23.8	+0.6	17.7	+0.9	53	+ 3	—	—	—	14.2
Quseir	1010.7	—0.4	27.9	—0.5	20.9	+0.2	24.4	24.6	+0.1	18.4	+0.6	52	+ 4	—	—	—	15.6

Note : Actual number of sunshine records at Alexandria 364 days only and at Kharga 362 days only.

TABLE A 2.—MAXIMUM AND MINIMUM AIR TEMPERATURES

YEAR — 1969

STATION	Maximum Temperature °C									Grass Min. Temp.		Minimum Temperature °C								
	Highest	Date	Lowest	Date	No. of Days with Max-Temp.					Mean	D. From Normal	Highest	Date	Lowest	Date	No. of Days with Min. Temp.				
					>25	>30	>35	>40	>45							<10	< 5	< 0	<- 5	
Sallum	47.3	15/6	13.3	28/1	187	84	10	4	2	16.1	—	28.4	12/6	5.7	4/1	43	0	0	0	
Mersa Matruh. (A)	45.2	15/6	11.6	28/1	172	21	4	3	1	—	—	27.0	25/6	3.8	5/1	68	3	0	0	
Alexandria (A)	39.0	15/6	12.0	22/1	187	44	6	0	0	—	—	25.0	8/9	4.6	7/12	59	2	0	0	
Port Said (A)	39.5	16/6	12.6	29/1	198	31	1	0	0	17.2	—	25.9	7/10	6.6	28,29/1	19	0	0	0	
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ghazza	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Tanta..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	0	0	
Cairo. (A)	45.4	16/6	11.1	28/1	247	174	47	3	1	—	—	25.2	15/6	4.0	2/1	55	1	0	0	
Fayoum	45.6	16/6	13.4	28/1	273	191	118	14	1	12.4	—	23.9	28/6	2.6	6/1	91	25	0	0	
Minya (A)	45.6	16/6	14.9	22/1	272	201	106	10	1	11.4	—	24.0	17/6	0.0	16/1	103	48	0	0	
Assyout (A)	47.4	16/6	14.7	29/1	279	209	127	26	2	13.7	—	27.9	16/6	2.8	29/1	81	16	0	0	
Luxor (A)	47.5	17/6	16.0	28/1	322	265	193	86	13	13.5	—	28.2	3/9	0.6	7/1	81	30	0	0	
Aswan (A)	46.8	16/6	15.5	29/1	326	269	203	120	19	—	—	29.8	29/8	3.5	3/1	50	3	0	0	
Siwa	47.9	15/6	13.4	27/1	265	188	120	21	2	12.2	—	26.1	15/6	-1.4	5/1	99	35	2	0	
Bahariya	47.6	16/6	14.7	29/1	271	197	123	18	2	13.5	—	26.9	16/6	0.9	3,5/1	90	32	0	0	
Farafra	46.6	16/6	13.7	23/1	262	207	128	25	1	13.3	—	26.4	16/6	-1.2	30,31/1	105	51	1	0	
Dakhla	47.1	16/6	14.8	29/1	292	224	147	41	3	—	—	31.6	15/6	-1.1	27/12	111	60	5	0	
Kharga	47.5	16/6	15.8	29/1	297	236	174	63	5	14.9	—	31.2	16/6	0.4	10/1	80	37	0	0	
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Hurgada	38.9	16/6	16.7	29/1	264	162	18	0	0	—	—	30.0	17/6	5.6	8/1	42	0	0	0	
Quesir	36.6	15/6	16.8	29/1	260	150	6	0	0	18.4	—	29.4	17/6	9.1	6/1	3	0	0	0	

TABLE A 3.—SKY COVER AND RAINFALL

YEAR 1969

Station	Mean Sky Cover (Oct)					Rainfall (mm)										
	00	06	12	18	Daily	Total Amount	Dev. From Normal	Max. Fall in one day		Number of days with Amount of Rain						
	U.T.	U.T.	U.T.	U.T.	Mean			Amount	Dte	<0.1	≥0.1	≥1.0	≥5.0	≥10	≥25	≥50
Sallum	3.2	2.8	3.1	2.6	2.9	152.3	+39.5	27.0	14/4	0	45	26	9	5	1	0
Mersa Matruh (A)	2.2	3.8	3.4	2.7	3.1	236.5	+93.0	28.1	19/10	9	40	27	12	9	1	0
Alexandria (A)	3.7	4.0	4.0	3.3	3.7	231.3	+38.4	42.6	22/1	5	42	26	11	7	2	0
Port Said (A)	—	2.8	2.4	—	—	56.0	-18.0	12.5	19/10	6	31	12	4	1	0	0
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ghazna	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	1.1	2.3	2.7	1.1	1.8	34.0	-12.9	6.0	21/3	3	22	10	1	0	0	0
Cairo (A)	1.6	3.4	2.7	1.6	2.3	30.8	+ 6.0	13.8	9/10	8	24	10	1	1	0	0
Fayoum	—	2.3	2.3	1.8	—	9.2	- 2.6	4.0	22/4	7	6	3	0	0	0	0
Minya (A)	0.7	1.8	1.7	1.2	1.3	5.0	+ 0.5	2.4	22/2	8	4	3	0	0	0	0
Assyout (A)	0.6	1.0	1.3	0.9	0.9	3.5	+ 3.2	2.5	14/4	7	2	2	0	0	0	0
Luxor (A)	0.7	1.2	1.4	1.3	1.1	0.5	- 0.6	0.5	30/8	6	1	0	0	0	0	0
Aswan (A)	0.7	1.0	1.4	1.0	1.1	Tr.	- 0.2	Tr.	16/4	1	0	0	0	0	0	0
Siwa	1.2	1.6	2.5	1.2	1.6	9.3	- 0.1	1.5	22/1	6	13	5	0	0	0	0
Bahariya	0.9	1.6	1.9	1.1	1.3	5.5	+ 1.4	2.4	12/1	14	3	3	0	0	0	0
Farafra	—	1.0	1.5	0.8	—	16.0	+14.2	7.7	23/1	0	7	3	1	0	0	0
Dakhla	0.6	0.6	0.9	0.6	0.6	10.9	+10.4	5.0	23/1	1	3	3	1	0	0	0
Kharga	0.4	0.9	1.2	0.8	0.9	2.3	+ 1.2	1.5	15/4	2	3	1	0	0	0	0
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	0.8	1.4	1.7	1.2	1.3	6.5	+ 3.2	2.7	15/4	4	6	3	0	0	0	0
Quseir	0.8	1.4	1.6	1.2	1.2	16.4	+13.5	8.3	7/10	9	4	3	2	0	0	0

TABLE A 4—DAYS OF OCCURRENCE OF MISCELLANEOUS WEATHER PHENOMENA

YEAR — 1969

Station	Precipitation				Frost	Thunderstorm	Mist Vis \geq 1000 metres	Fog Vis $<$ 1000 Metres	Haze Vis \geq 1000 Metres	Thick Haze Vis $<$ 1000 Metres	Dust or Sandrising Vis \geq 1000 Metres	Dust or Sandstorm Vis $<$ 1000 Metres	Gale	Clear Sky	Cloudy Sky
	Rain	Snow	Ice Pellets	Hail											
Sallum	45	0	0	0	0	4	0	0	1	0	30	2	0	152	22
Mersa Matruh (A)	40	0	0	0	0	6	22	6	2	0	67	6	1	121	26
Alexandria (A)	42	0	0	0	0	7	29	21	14	0	24	5	0	78	29
Port Said (A)	31	0	0	1	0	0	2	0	0	0	10	3	0	—	0
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gharra	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	22	0	0	0	0	1	35	11	3	0	0	0	0	—	—
Cairo	24	0	0	1	0	2	87	21	74	0	53	8	2	183	6
Fayoum	6	0	0	0	0	0	5	1	0	0	4	1	0	—	—
Minya (A)	4	0	0	0	0	0	45	4	28	0	21	3	0	270	7
Assyout (A)	2	0	0	0	0	1	7	2	17	1	21	3	2	308	5
Luxor (A)	1	0	0	0	0	1	1	0	67	0	29	3	0	283	7
Aswan (A)	0	0	0	0	0	0	0	0	3	0	44	12	4	288	5
Siva	13	0	0	0	0	2	0	0	4	0	30	5	0	237	7
Bahariya	3	0	0	0	0	0	3	0	2	0	18	3	0	267	4
Farafra	7	0	0	0	0	0	1	0	5	0	7	3	0	—	—
Dakhla	3	0	0	0	0	0	0	0	7	0	52	1	1	312	3
Kharga	3	0	0	0	0	0	0	0	2	0	67	0	0	305	4
Tor.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	6	0	0	0	0	3	1	1	13	0	86	1	7	263	7
Quesir	4	0	0	0	0	3	1	0	9	0	11	1	0	283	2

**Table A-5.—NUMBER IN HOURS OF OCCURRENCES OF CONCURRENT SURFACE
WIND SPEED AND DIRECTION RECORDED WITHIN SPECIFIED RANGES
YEAR — 1969**

Station	calm (hours)	Variable (hours)	Unrecorded (hours)	Wind speed in knots	Number in hours of occurrences of wind blowing from the ranges of directions indicated												
					345	015	045	075	105	135	165	195	225	255	285	315	All directions
					/	/	/	/	/	/	/	/	/	/	/	/	
					014	044	074	104	134	164	194	224	254	284	314	344	
Sallum	96	9	21	1-10	463	809	871	510	424	162	135	145	217	375	756	1021	5888
				11-27	120	234	158	44	10	3	18	144	312	369	619	698	2729
				28-47	0	0	0	0	0	0	0	1	8	2	4	2	17
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	583	1043	1029	554	434	165	153	290	537	746	1379	1721	8634
Mreas Matrnh . (A)	165	2	6	1-10	730	510	180	200	258	260	243	299	453	732	483	699	5047
				11-27	302	178	102	128	181	79	164	241	372	337	472	913	3469
				28-47	0	0	0	0	0	0	12	28	3	11	9	8	71
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1032	688	282	328	439	339	419	568	828	1080	964	1620	8587
Alexandria . . . (A)	24	3	237	1-10	585	400	272	283	328	276	330	301	164	521	1359	1607	6426
				11-27	135	84	34	19	10	29	66	261	195	220	607	422	2062
				28-47	0	0	0	0	0	0	1	4	2	0	1	0	8
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	720	484	286	302	338	285	397	566	261	741	1967	2029	8496
Port Said . . . (A)	40	3	301	1-10	811	503	245	156	125	139	160	337	610	428	549	1237	5300
				11-27	306	246	240	144	48	46	155	335	274	268	514	522	3098
				28-47	0	0	0	0	0	0	2	3	5	4	1	3	18
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1117	749	485	300	173	185	317	675	889	700	1064	1762	8416
Tanta	631	2	791	1-10	605	366	257	243	122	125	584	741	779	996	1207	974	6999
				11-27	31	13	6	3	0	7	27	70	57	52	43	28	337
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	636	379	263	246	122	132	611	811	836	1048	1250	1002	7336
Cairo	659	14	46	1-10	766	970	703	406	142	110	240	235	228	325	559	822	5506
				11-27	412	588	202	85	41	32	256	319	122	129	83	251	2520
				28-47	0	0	0	0	0	0	14	1	0	0	0	0	15
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1178	1558	905	491	183	142	510	555	350	454	642	1073	8041
Fayoum	219	17	38	1-10	3038	2261	212	96	83	193	352	392	460	237	283	474	8081
				11-27	34	193	2	0	0	0	31	41	66	29	6	3	405
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	3072	2454	214	96	83	193	383	433	526	266	289	477	8486
Minya	579	39	12	1-10	3420	408	105	18	16	391	363	120	145	134	221	684	6025
				11-27	1712	105	12	0	1	21	58	18	22	48	64	44	2105
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All Speeds	5132	513	117	18	17	412	421	138	167	182	285	728	8130

**Table A 5 (contd.)—NUMBER IN HOURS OF OCCURRENCE OF CONCURRENT SURFACE
WIND SPEED AND DIRECTION RECORDED WITHIN SPECIFIED RANGES**

YEAR — 1969

Station	calm (hours)	Variable (hours)	Unrecorded (hours)	Wind speed in knots	Number in hours of occurrences of wind blowing from the ranges of directions indicated												
					345 / 014	015 / 044	045 / 074	075 / 104	105 / 134	135 / 164	165 / 194	195 / 224	225 / 254	255 / 284	285 / 314	315 / 344	All directions
Assyout. (A)	79	1	69	1-10 11-27 28-47 ≥48 All speeds	344 300 0 0 644	104 57 0 0 161	112 4 0 0 116	165 4 0 0 169	205 19 0 0 224	173 48 1 0 222	259 124 7 0 390	158 110 3 0 271	737 137 1 0 875	2005 260 2 0 2267	1594 568 0 0 2162	704 406 0 0 1110	6560 2037 14 0 8611
uxor (A)	110	38	33	1-10 11-27 28-47 ≥48 All speeds	506 5 0 0 511	340 7 0 0 347	234 8 0 0 239	350 0 0 0 350	261 1 0 0 262	682 9 0 0 691	1265 15 0 0 1290	527 25 0 0 532	713 36 0 0 749	1163 79 0 0 1243	1453 178 0 0 1631	711 14 0 0 725	8205 374 0 0 8579
Aswan (A)	27	63	10	1-10 11-27 28-47 ≥48 All speeds	3041 794 0 0 3835	893 234 0 0 1127	138 6 0 0 144	66 5 0 0 71	83 7 0 0 90	93 9 0 0 102	130 33 0 0 163	62 10 0 0 72	94 12 0 0 106	238 54 0 0 292	370 122 0 0 492	1448 718 0 0 2165	6656 2004 0 0 8660
Siwa	241	42	13	1-10 11-27 28-47 ≥48 All speeds	346 57 0 0 403	792 162 1 0 955	730 86 0 0 816	800 70 0 0 876	723 98 0 0 821	414 38 0 0 452	259 53 0 0 312	204 29 7 0 240	310 41 1 0 352	743 160 0 0 903	910 263 0 0 1173	923 238 0 0 1161	7154 1301 9 0 8464
Dakhla	163	24	16	1-10 11-27 28-47 ≥48 All speeds	601 184 4 0 789	375 177 0 0 552	295 28 0 0 323	354 2 0 0 356	274 4 0 0 278	225 2 0 0 227	472 7 0 0 479	313 9 0 0 322	547 9 0 0 556	1047 49 8 0 1104	1433 101 10 0 1544	1474 553 0 0 2027	7410 1125 22 0 8557
Kharga	90	33	104	1-10 11-27 28-47 ≥48 All speeds	1501 1949 1 0 3451	602 192 0 0 794	177 10 0 0 187	76 0 0 0 76	100 0 0 0 100	126 3 0 0 129	152 29 0 0 181	109 21 0 0 130	155 7 0 0 162	249 41 0 0 290	550 86 0 0 636	1603 794 0 0 2397	5400 3122 1 0 8533
Murghada	122	3	81	1-10 11-27 28-47 ≥48 All speeds	278 1688 74 0 2040	250 235 0 0 485	106 7 0 0 113	81 5 0 0 86	128 48 0 0 186	163 110 2 0 275	96 54 1 0 151	40 6 0 0 46	58 2 0 0 60	124 54 0 0 178	673 954 4 0 1631	621 2570 112 0 3393	2628 5733 193 0 8554
Queir	59	7	45	1-10 11-27 28-47 ≥48 All speeds	971 1539 2 0 2512	551 150 0 0 710	184 0 0 0 184	160 4 0 0 164	173 3 0 0 176	162 20 0 0 182	164 6 0 0 170	133 13 0 0 146	256 19 0 0 276	659 154 1 0 845	1016 255 2 0 1273	1356 649 6 0 2011	5815 2821 13 0 8649

UPPER AIR CLIMATOLOGICAL DATA

Table B 1.—MONTHLY MEANS, ABSOLUTE HIGHER AND LOWER VALUES OF
ALTITUDE, AIR TEMPERATURE AND DEW POINT AT STANDARD
AND SELECTED PRESSURE SURFACES
YEAR 1969

Station	Pressure Surface (Millibar)	Altitude of Pressure Surface (gpm)						Temperature (°C)						Dew Point (°C)	
		N	Mean	Highest		Lowest		N	Mean	Highest		Lowest		N	Mean
				Value	Month	Value	Month			Value	Month	Value	Month		
Marsa Matruh 0060 UT	Surface	324	*1011	*1025	Jan.	*995	Jan.	324	17.6	28.6	June	6.8	Feb., Mar.	324	13.4
	1000	321	119	233	Jan.	17	Jan.	319	18.1	32.2	June	7.4	Jan.	319	13.9
	850	322	1502	1584	Nov.	1325	Jan.	322	12.9	28.0	June	— 3.2	Jan.	322	2.2
	700	315	3111	3223	July	2867	Jan.	313	4.7	15.8	Aug.	—11.0	Jan.	312	— 8.8
	600	310	4351	4515	June	4051	Jan.	309	— 3.1	9.9	Aug.	—19.1	Jan.	304	—16.3
	500	305	5770	5978	Aug.	5405	Jan.	305	—12.9	— 0.2	Aug.	—28.7	Jan.	300	—25.1
	400	295	7434	7716	Aug.	7019	March	295	—24.8	— 9.4	July	—40.3	Jan.	292	—36.3
	300	284	9470	9834	Aug.	8928	Jan.	284	—40.1	—25.0	July	—53.0	Jan.	286	—50.1
	250	256	10687	11120	Aug.	10130	Jan.	256	—48.5	—27.2	July	—51.0	Feb.	228	—58.2
	200	234	12130	12620	Aug.	11578	Jan.	233	—55.9	—44.5	July	—67.6	Feb.	150	—62.8
	150	186	13931	14451	Aug.	13436	Jan.	186	—61.0	—49.3	April	—71.5	Nov.	19	—67.1
	100	134	16426	16902	July	15980	Jan.	134	—67.3	—57.7	Nov.	—80.0	July	1	—72.4
	70	79	18594	18980	July	18240	Feb.	79	—65.7	—58.3	Oct.	—74.5	Mar., July	—	—
	60	71	19546	20025	July	19197	Feb.	71	—63.6	—58.5	Apr., Sep.	—72.0	July	—	—
	50	55	20686	21167	July	20313	Feb.	55	—62.3	—51.8	Aug.	—69.0	Feb.	—	—
	40	32	22109	22434	Aug.	21713	Feb.	32	—58.6	—46.1	July	—64.9	Feb.	—	—
	30	18	23924	24280	Aug.	23505	Feb.	18	—55.8	—43.0	Aug.	—60.3	Feb.	—	—
	20	5	26401	26761	July	26077	Feb.	5	—52.5	—51.5	July	—59.0	Feb.	—	—
	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Helwan 0000 UT	Surface	348	997m.b.	1011m.b.	Jan.	985m.b.	March	348	18.0	29.6	June	5.2	Jan.	348	11.0
	1000	314	*114	230	Jan.	11	March	92	13.9	24.1	Oct.	6.4	Jan.	92	6.7
	850	345	1498	1569	Jan.	1390	Jan.	345	14.4	27.3	Sept.	— 3.1	Jan.	337	— 1.5
	700	345	3114	3208	Sept.	2918	March	345	5.9	16.4	Jun., Jul.	—10.3	Jan.	335	—12.1
	600	344	4357	4476	Sept.	4110	Jan.	344	— 2.1	10.0	July	—17.9	Jan.	335	—18.8
	500	342	5772	5953	July	5468	Jan.	342	—11.9	0.5	Aug.	—27.0	Jan.	333	—20.8
	400	335	7450	7678	Aug.	7043	Jan.	335	—24.1	— 9.7	July	—38.7	Jan.	326	—27.9
	300	323	9485	9826	Aug.	8952	Jan.	323	—39.0	—22.9	Aug.	—52.9	Jan.	312	—50.6
	250	316	10695	11141	Aug.	10116	Jan.	316	—47.4	—30.7	July	—58.9	Feb.	301	—58.9
	200	305	12158	12686	Aug.	11583	Jan.	305	—54.8	—41.2	Aug.	—66.5	Feb.	222	—63.8
	150	277	13978	14592	Aug.	13441	Jan.	277	—61.0	—48.4	March	—69.7	Dec.	65	—67.0
	100	250	16449	17129	Aug.	15975	Jan.	250	—68.3	—58.8	March	—79.2	Aug.	2	—66.5
	70	207	18588	19150	Aug.	18140	May	207	—66.5	—57.7	Nov.	—82.5	July	—	—
	60	175	19528	20159	Aug.	19115	Jan.	175	—63.6	—56.4	Jan.	—75.3	Aug.	—	—
	50	160	20658	21221	Aug.	20264	Feb.	160	—61.0	—49.8	Aug.	—75.5	Aug.	—	—
	40	127	22071	22399	July	21618	Feb.	127	—58.3	—52.5	Jan.	—64.4	April	—	—
	30	108	23880	24244	Aug.	23378	Feb.	108	—55.4	—50.3	June	—67.1	Jan.	—	—
	20	59	26502	26801	July	25908	Feb.	59	—50.9	—45.5	Feb.	—58.9	Feb.	—	—
	10	1	30867	—	—	—	—	1	—53.3	—	—	—	—	—	—
Aswan 0000 UT	Surface	355	991m.b.	1002m.b.	Jan.	980m.b.	March	355	22.2	34.2	Aug.	6.0	Jan.	354	3.2
	1000	355	*84	210	Jan.	21	March	—	—	—	—	—	—	—	—
	850	355	1494	1585	March	1431	Jan.	355	20.3	31.9	Jun., Aug.	2.1	Jan.	354	— 1.7
	700	355	3141	3230	March	3002	Jan.	355	10.8	28.4	May	— 3.1	Jan.	354	—10.4
	600	353	4393	4497	June	4190	Jan.	353	1.3	9.3	July	—12.2	Jan.	352	—17.6
	500	352	5843	5970	June	5568	Jan.	352	— 8.2	0.1	Jul., Aug.	—16.2	Jan.	351	—26.3
	400	350	7541	7704	July	7223	Jan.	350	—19.6	— 9.5	July	—31.4	Jan.	348	—36.0
	300	340	9613	9859	July	9269	Jan.	340	—34.8	—23.2	July	—45.6	Jan.	337	—48.4
	250	328	10832	11153	July	10479	Jan.	328	—43.6	—34.2	July	—51.8	Feb., Nov.	324	—55.9
	200	323	12326	12662	July	11906	Jan.	323	—52.9	—41.7	Sept.	—63.1	Jan.	311	—63.8
	150	304	14144	14521	July	13719	Jan.	304	—63.1	—54.9	Jan.	—70.8	Dec.	19	—69.5
	100	283	16577	16960	July	16184	Jan.	283	—72.6	—63.0	May, Oct.	—80.3	Aug.	—	—
	70	219	18521	19030	July	18280	Jan.	219	—69.1	—53.7	May	—81.1	Dec.	—	—
	60	174	19617	19908	July	19314	Jan.	174	—65.1	—53.0	May	—75.4	May	—	—
	50	170	20738	21026	July	20443	Jan.	170	—61.8	—51.8	Nov.	—75.1	May	—	—
	40	128	22128	22429	May	21834	Jan.	128	—58.7	—53.5	Aug.	—64.7	Mar.	—	—
	30	114	23956	24267	May	23621	Jan.	114	—55.0	—45.0	Oct.	—63.6	Feb.	—	—
	20	73	25746	26899	May	25126	Jan.	73	—46.0	—42.8	June	—59.8	Jan.	—	—
	10	4	31059	31284	June	30711	Jan.	4	—44.6	—37.2	Dec.	—55.6	Jan.	—	—

N — Number of cases the element has been observed during the year.

* The atmospheric pressure corrected to the elevation of the radiosonde station.

UPPER AIR CLIMATOLOGICAL DATA

TABLE B 1 (contd.)—ANNUAL MEANS AND ANNUAL ABSOLUTE HIGHER AND LOWER VALUES OF ALTITUDE, AIR TEMPERATURE AND DEW POINT AT STANDARD AND SELECTED PRESSURE SURFACES

YEAR 1969

Station	Pressure Surface (Millibar)	Altitude of Pressure Surface (gpm)						Temperature (°C)						Dew Point (°C)	
		N	Mean	Highest		Lowest		N	Mean	Highest		Lowest		N	Mean
				Value	Month	Value	Month			Value	Month	Value	Month		
Mersa Matruh 1200 UT	Surface	278	1011m.b.	1024m.b.	Jan.	994m.b.	Mar.	278	22.1	32.0	Aug.	10.9	Jan.	278	14.3
	1000	277	119	228	Jan.	01	Jan.	275	20.6	31.8	Aug.Sep.	9.7	Jan.	275	12.8
	850	278	1503	1581	Nov.	1358	Jan.	277	12.3	27.0	Aug.	— 2.5	Jan.	276	0.9
	700	266	3107	3229	Aug.	2911	Jan.	266	4.0	15.4	Aug.	— 9.1	April	260	—10.3
	600	264	4343	4508	Aug.	4032	Jan.	254	— 3.5	8.2	Aug.	—18.0	Jan.	234	—19.0
	500	235	5762	5962	Aug.	5370	Jan.	235	—13.1	— 1.2	July	—27.2	Jan.	217	—26.7
	400	221	7423	7659	Sept.	6950	Jan.	221	—24.6	—10.5	July	—39.5	Jan.	189	—37.0
	300	203	9454	9804	July	8918	Jan.	202	—39.3	—25.0	July	—53.9	Jan.	167	—48.6
	250	191	10685	11099	July	10120	Jan.	191	—47.8	—34.7	July	—57.9	Jan.	102	—58.4
	200	170	12130	12611	July	11519	Jan.	170	—55.2	—45.3	Mar.	—67.4	Feb.	27	—63.7
	150	121	13944	14406	Aug.	13404	Jan.	121	—59.5	—47.8	Mar.	—70.9	Nov.	4	—65.0
	100	82	16468	16824	Aug.	16012	Jan.	82	—65.1	—53.4	Jan.	—75.5	Aug.	—	—64.5
	70	51	18617	18940	Aug.	18240	Jan.	51	—64.2	—58.0	Sep.Oct.	—70.0	Feb.	—	—
	60	36	19613	19860	Aug.	19283	Feb.	36	—61.5	—56.4	Sept.	—66.6	Feb.	—	—
	50	26	20719	21012	Aug.	20399	Feb.	26	—59.0	—53.8	Sept.	—64.0	Mar.	—	—
	40	12	22112	22438	Aug.	21798	Feb.	12	—55.8	—52.1	Aug.	—59.3	Feb.	—	—
	30	5	23948	24292	Aug.	23612	Feb.	5	—56.8	—51.7	Aug.	—61.6	Aug.	—	—
	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Helwan 1200 UT	Surface	273	996m.b.	1011m.b.	Jan.	983m.b.	Mar.	273	25.6	38.0	Sept.	8.1	Jan.	273	7.9
	1000	273	111	232	Jan.	04	Mar.	76	19.1	29.0	Oct.	8.0	Jan.	76	7.3
	850	273	1506	1592	Mar.	1365	Mar.	273	13.9	28.4	Aug.	— 2.5	Jan.	271	— 2.2
	700	269	3119	3218	Aug.	2922	Jan.	269	5.2	16.5	Aug.	—11.1	Jan.	265	—13.0
	600	267	4370	4493	Aug.	4105	Jan.	267	— 2.7	9.3	Sept.	—17.4	Jan.	265	—20.0
	500	262	5773	5973	Aug.	5423	Jan.	262	—12.3	0.4	Aug.	—27.5	Jan.	259	—26.2
	400	254	7446	7708	Aug.	7017	Jan.	254	—24.4	—11.4	Aug.	—40.4	Jan.	251	—39.7
	300	248	9480	9828	Aug.	8979	Jan.	248	—39.3	—26.5	Aug.	—51.3	Jan.	243	—52.9
	250	240	10658	11102	Aug.	10190	Jan.	240	—47.6	—36.0	Aug.	—58.6	Jan.	233	—58.7
	200	233	12152	12612	Aug.	11611	Jan.	233	—55.1	—45.4	Mar.	—69.4	Mar.	184	—65.6
	150	211	13968	14441	Aug.	13448	Jan.	211	—60.0	—48.4	Jan.	—69.4	Dec.	64	—69.3
	100	173	16468	16869	Sept.	15994	Jan.	173	—66.5	—52.5	Mar.	—81.8	Aug.	6	—70.4
	70	138	18641	18950	Aug.	18210	Jan.	138	—64.1	—58.5	Jan.	—78.3	Apr.	—	—
	60	119	19599	19990	Sept.	19178	Jan.	119	—61.5	—51.9	Sept.	—74.0	Jan.	—	—
	50	107	20710	21150	Sept.	20342	Jan.	107	—58.9	—41.7	Sept.	—66.6	Mar. Sept.	—	—
	40	81	22166	22592	Sept.	21752	Jan.	81	—55.7	—49.1	Dec.	—61.3	Mar.	—	—
	30	69	23973	24478	Sept.	23590	Jan.	69	—52.1	—43.6	Dec.	—58.1	Dec.	—	—
	20	45	26632	27170	Sept.	26192	Jan.	45	—48.0	—41.2	Sept.	—54.2	Jan.	—	—
	10	2	31013	31280	May.	30926	Dec.	2	—43.5	—38.6	May	—48.4	Dec.	—	—
Awan 1200 UT	Surface	277	988m.b.	1002m.b.	Jan.	980m.b.	518	277	31.6	44.7	Aug.	13.8	Jan.	277	5.1
	1000	277	83	210	Jan.	07	May	2	15.1	16.7	Jan.	13.7	Jan.	2	— 2.2
	850	277	1508	1568	Jan.	1443	Apr.	277	19.9	32.4	May.Aug.	4.0	Jan.	277	— 4.3
	700	273	3148	3218	Aug.	3001	Jan.	273	9.0	19.0	Aug.	— 2.0	Jan.	273	—13.4
	600	267	4408	4500	Aug.	4239	Jan.	267	1.4	9.4	Aug.	—11.4	Jan.	266	—19.8
	500	264	5853	5957	Aug.	5553	Jan.	264	— 8.4	1.6	Aug.	—19.6	Jan.	264	—27.7
	400	260	7542	7709	Aug.	7270	Jan.	259	—20.3	—10.3	Aug.	—32.6	Jan.	258	—38.1
	300	252	9614	9868	Aug.	9238	Jan.	252	—35.0	—22.0	Aug.	—46.0	Jan.	249	—50.4
	200	246	10863	11168	Aug.	10456	Jan.	246	—43.6	—34.7	Aug.	—52.0	Jan.	245	—57.7
	150	242	12333	12696	Aug.	11924	Jan.	242	—52.9	—45.0	Jan.	—60.3	Feb.	239	—65.0
	100	223	14148	14554	Aug.	13772	Jan.	223	—61.9	—51.4	Feb.	—69.2	Oct.	44	—70.8
	70	205	16590	16984	Aug.	16259	Jan.	205	—70.4	—61.0	Jan.	—78.5	Aug.	—	—
	60	164	18723	19087	Aug.	18430	Jan.	164	—67.7	—58.0	Jan.	—68.7	Oct.	—	—
	50	121	19661	20027	Aug.	19340	Jan.	121	—63.1	—49.8	Oct.	—72.3	Mar.	—	—
	40	116	20799	21160	Aug.	20494	Jan.	116	—59.8	—52.2	Aug.	—72.3	Oct.	—	—
	30	73	22204	22501	Sept.	21900	Jan.	73	—55.4	—50.0	Sept.	—63.0	Feb.	—	—
	20	63	24054	24408	Sept.	23645	Jan.	62	—51.7	—41.4	Nov.	—58.0	Jan.	—	—
	10	48	26622	27177	Sept.	26252	Jan.	48	—44.8	—35.7	Sept.	—52.3	Feb.	—	—
		2	31456	31523	May	31388	Feb.	2	—33.9	—33.4	Feb.	—34.4	May	—	—

N = Number of cases the element has been observed during the month.

* The atmospheric pressure corrected to the elevation of the radiosonde station.

**TABLE B 2.—MEAN AND EXTREME VALUES OF THE FREEZING LEVEL AND THE TROPOPAUSE ;
THE HIGHEST WIND SPEED IN THE UPPER AIR
YEAR — 1969**

Station	Freezing Level									First Tropopause									Highest wind speed				
	Mean			Highest			Lowest			Mean			Highest			Lowest			Altitude (gpm)	Pressure (mb.)	Direction (000-360)°	Speed in Knots	
	Altitude (gpm)	Pressure (mb.)	Dew point (°C)	Altitude (gpm)	Pressure (mb.)	Dew Point (°C)	Altitude (gpm)	Pressure (mb.)	Dew Point (°C)	Altitude (gpm)	pressure (mb.)	Temperature (°C)	Altitude (gpm)	Pressure (mb.)	Temperature (°C)	Altitude (gpm)	Pressure (mb.)	Temperature (°C)					
6000 U.T.	(N)	(N)	(N)							(N)	(N)	(N)											
	M. Matruh	3807 (309)	648 (309)	-12.0 (298)	5940 (Aug)	502	- 9.3	1120 (Jan)	892	- 3.7	12768 (162)	188 (162)	-62.3 (162)	18090 (July)	81	-73.0	7970 (Jan)	349	-46.7	9350 (April)	299	290	170
	Helwan	3957 (344)	633 (344)	-16.9 (335)	6000 (Aug)	495	-19.1	1100 (Jan)	892	- 2.7	13446 (245)	171 (245)	-63.7 (245)	18380 (Aug)	81	-70.6	7091 (Jan)	400	-36.9	13370 (Sept)	170	240	166
	Aswan	4568 (352)	587 (352)	-18.5 (350)	5990 (Aug)	495	-25.1	1880 (Jan)	808	- 5.5	16186 (240)	109 (240)	-72.9 (240)	22530 (May)	38	-55.2	11340 (Jan)	218	-57.3	11965 (Jan)	204	255	195
1200 U.T.	(N)	(N)	(N)							(N)	(N)	(N)											
	M. Matruh	3730 (252)	643 (252)	-13.2 (243)	5810 (Aug)	515	-22.0	1220 (Jan)	880	- 4.2	13953 (130)	190 (130)	-61.0 (130)	16824 (Aug)	100	-74.2	7116 (Dec)	400	-39.5	9635 (April)	287	230	176
	Helwan	3893 (266)	641 (266)	-16.7 (266)	6330 (Aug)	476	-20.8	1150 (Jan)	884	- 1.5	13064 (191)	180 (191)	-61.3 (191)	17140 (April)	90	-71.5	8000 (Jan)	352	-39.0	13380 (April)	163	230	172
	Aswan	4574 (264)	590 (264)	-20.4 (257)	6190 (Aug)	486	-25.9	2000 (Jan)	795	-10.2	15979 (176)	120 (176)	-68.1 (176)	18910 (March)	67	-76.6	11530 (April)	221	-54.1	11920 (Jan)	205	245	200

N = The number of cases the element has been observed during the year.

Table B3.— NUMBER OF OCCURRENCES OF WIND DIRECTION WITHIN SPECIFIED RANGES AND THE MEAN SCALAR WIND SPEED AT THE STANDARD AND SELECTED PRESSURE SURFACES

MERSA MATRUH (A) — YEAR 1969

Time	Pressure Surface (Millibar)	Wind between specified ranges of direction (000-360)°																				Number of Calm winds	Total Number of Observations (TN)	Mean Scalar wind Speed (Knots)				
		345		015		045		075		105		135		165		195		225		255					285		315	
		014		044		074		104		134		164		194		224		254		284					314		344	
		N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)	N	(ff)				N	(ff)	N	(ff)
0000 U.T.	Surface	34	9	16	8	2	8	5	8	18	10	22	6	23	9	27	9	39	8	50	9	30	11	37	11	23	324	9
	1000	35	11	19	10	9	10	8	10	21	14	17	11	9	14	7	19	13	16	28	11	48	16	52	14	3	269	13
	850	57	16	24	12	8	12	6	11	6	7	0	—	6	14	5	22	20	23	31	22	50	20	48	16	0	271	17
	700	29	21	12	15	1	16	3	8	0	0	1	9	5	20	5	20	40	31	43	23	70	25	52	19	0	261	23
	600	26	22	6	12	2	10	3	13	2	5	0	—	1	6	10	28	34	30	67	31	71	28	35	24	0	257	28
	500	8	19	7	14	4	19	2	7	1	4	1	8	0	—	10	23	35	38	89	37	63	30	30	37	0	250	34
	400	9	27	4	29	2	14	2	22	0	—	0	—	2	10	15	31	40	47	86	46	51	43	23	39	0	234	43
	300	6	34	1	14	2	26	0	—	0	—	0	—	2	16	18	22	44	57	76	60	49	50	16	49	0	214	54
	250	6	26	1	32	1	6	0	—	0	—	1	12	5	21	19	33	42	58	62	60	41	58	9	43	0	187	57
	200	2	18	1	15	1	15	0	—	0	—	1	36	4	30	20	54	40	58	56	63	27	68	8	56	1	161	62
	150	0	—	0	—	0	—	0	—	0	—	0	—	7	29	23	28	35	47	45	54	13	55	2	54	0	125	55
	100	0	—	1	20	0	—	0	—	0	—	2	14	14	25	11	22	23	36	17	39	10	32	0	—	0	78	36
	70	0	—	2	12	2	16	11	14	2	14	7	16	3	17	5	19	5	32	1	50	3	20	1	6	1	43	17
60	0	—	3	14	2	13	7	18	5	24	1	9	4	13	1	21	3	8	2	16	3	15	0	—	0	31	16	
50	2	14	0	—	4	19	9	24	4	18	1	11	1	15	1	12	1	21	2	32	1	22	1	3	1	28	19	
40	0	—	0	—	0	—	6	19	1	10	0	—	0	—	0	—	1	23	1	4	0	—	1	12	0	10	16	
30	1	10	0	—	0	—	2	48	0	—	0	—	0	—	0	—	0	—	0	—	—	—	0	—	—	—	3	29
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1200 U.T.	Surface	46	10	37	10	9	11	12	13	5	11	8	12	9	18	11	13	10	19	18	21	34	16	76	13	2	277	14
	1000	36	12	28	12	7	12	12	13	7	11	5	13	6	18	15	19	8	14	19	17	34	18	84	17	3	264	15
	850	24	13	11	12	8	13	6	8	2	14	3	11	8	18	21	19	32	14	53	16	54	18	47	15	2	271	16
	700	21	17	8	10	0	—	0	—	0	—	0	—	1	17	13	14	36	31	67	24	65	25	39	20	0	250	22
	600	9	26	1	14	1	12	0	—	0	—	0	—	3	5	9	29	46	31	71	29	58	28	33	23	0	231	27
	500	7	18	3	9	3	14	0	—	0	—	0	—	1	72	8	35	45	41	81	34	54	33	10	45	0	212	34
	400	3	28	3	20	2	14	0	—	0	—	0	—	1	83	3	25	43	52	74	45	52	46	11	29	0	192	46
	300	2	48	1	34	1	25	0	—	0	—	0	—	0	—	6	44	43	59	62	66	32	59	10	68	1	158	60
	250	0	—	1	29	1	11	0	—	0	—	0	—	0	—	8	35	25	58	59	70	33	69	8	73	1	136	65
	200	0	—	0	—	0	—	0	—	0	—	0	—	1	26	2	40	24	60	53	74	26	68	6	55	0	112	67
	150	0	—	0	—	0	—	0	—	0	—	0	—	1	44	3	36	16	41	29	71	17	57	2	54	0	68	60
	100	0	—	0	—	0	—	0	—	1	22	1	40	2	16	6	22	10	33	13	54	7	43	0	—	0	40	42
	70	0	—	0	—	1	5	0	—	3	24	2	23	2	10	2	7	2	19	2	31	6	20	0	—	0	20	20
60	0	—	0	—	0	—	1	11	3	12	3	18	0	—	3	9	2	14	1	40	0	—	0	—	0	13	15	
50	0	—	0	—	1	4	2	17	3	18	0	—	2	8	0	—	1	24	1	47	1	13	0	—	0	11	16	
40	0	—	0	—	0	—	1	37	1	23	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	2	36
30	0	—	0	—	0	—	0	—	1	42	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	1	42
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

N = The number of cases the element has been observed during the month.

TN = The total number of cases the wind has been observed for all directions during the month.

**Table B 3. (Cont.) - NUMBER OF OCCURRENCES OF WIND DIRECTION WITHIN SPECIFIED RANGES AND
THE MEAN SCALAR WIND SPEED AT THE STANDARD AND SELECTED PRESSURE SURFACES
HELWAN - YEAR 1969**

Time	Pressure Surface (Millibar)	Wind between specified ranges of direction (000-360)*																								Number of Cum winds	Total Number of Observations (T N)	Mean Scalear wind Speed (Knots)	
		345		015		045		075		105		135		165		195		225		255		285		315					
		014		044		074		104		134		164		194		224		254		284		314		344					
		N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m				
0000 U.T.	Surface*	96	6	47	9	57	8	9	6	24	5	14	6	7	7	8	8	2	4	10	11	12	7	42	6	20	348	8	
	1000	16	6	15	13	23	10	1	3	8	6	4	7	0	—	2	18	1	2	3	9	4	6	7	8	1	85	11	
	850	52	18	23	16	8	14	6	9	2	10	3	8	17	15	24	20	51	20	50	17	40	19	49	17	1	326	19	
	700	22	20	3	17	1	12	2	4	2	12	7	14	16	21	41	25	66	25	74	26	49	25	38	26	0	321	25	
	600	11	16	3	13	0	—	2	10	4	8	2	40	10	26	43	29	84	33	84	32	44	28	21	29	0	308	30	
	500	2	18	0	16	3	14	2	7	4	12	5	15	12	24	37	39	88	45	82	36	35	34	12	35	0	288	38	
	400	5	18	3	16	8	17	1	21	3	12	3	26	8	26	37	44	78	48	73	52	24	46	8	47	0	246	48	
	300	4	19	2	29	3	16	0	—	1	22	3	34	13	28	22	37	62	62	51	55	24	65	6	51	0	191	57	
	250	3	41	1	29	1	22	2	16	3	18	7	21	12	40	23	50	56	70	33	67	17	64	2	22	0	160	70	
	200	1	18	1	5	0	—	2	24	3	18	5	35	13	42	20	48	42	59	27	67	8	86	3	36	0	125	63	
	150	1	47	0	—	0	—	0	—	5	21	7	35	9	40	10	53	28	70	15	82	2	49	1	8	0	78	71	
	100	0	—	0	—	0	—	0	—	1	45	2	48	4	16	6	42	7	39	8	45	1	18	1	43	0	30	41	
	70	0	—	0	—	0	40	1	41	2	64	0	—	0	—	0	—	0	—	3	44	1	16	1	35	0	9	52	
	60	0	—	0	—	0	—	0	—	3	43	0	—	0	—	0	—	0	—	0	—	2	9	0	—	0	5	26	
50	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	1	5	0	—	0	—	0	0	2	12	
40	1	49	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	1	19
30	0	—	1	11	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	1	11
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1200 U.T.	Surface	48	9	35	12	9	7	4	7	2	4	2	5	23	10	31	8	21	8	18	8	43	10	36	9	1	273	9	
	1000	18	13	12	14	1	5	1	6	0	—	2	3	3	11	9	6	6	7	4	16	10	11	10	9	0	76	11	
	850	41	14	22	12	14	19	0	—	5	7	7	12	23	11	24	22	43	19	25	16	24	13	39	14	1	268	16	
	700	13	21	6	13	3	11	1	8	5	10	2	15	19	27	27	24	68	28	57	26	42	26	16	28	0	259	27	
	600	9	14	3	5	2	10	1	9	1	6	3	13	12	29	33	28	64	34	62	34	38	34	10	45	0	238	32	
	500	1	34	2	16	1	16	1	14	3	15	0	—	10	31	31	35	67	41	71	45	28	36	9	38	0	224	41	
	400	1	15	2	9	2	34	2	38	3	17	1	13	5	43	25	49	52	50	67	56	22	46	3	57	0	185	54	
	300	0	—	3	18	2	24	1	24	3	49	5	21	4	48	17	43	37	73	48	66	14	60	2	77	0	136	65	
	250	2	16	3	20	0	—	1	13	1	37	4	18	7	62	14	47	29	73	36	76	9	58	2	72	0	108	68	
	200	0	—	0	—	0	—	0	—	1	23	4	18	4	20	14	59	30	67	19	73	6	67	2	73	0	80	70	
	150	0	—	0	—	0	—	0	—	2	24	1	23	0	—	11	42	15	82	20	67	2	46	0	—	0	51	66	
	100	0	—	0	—	0	—	1	22	1	23	2	57	2	30	2	32	4	42	8	35	1	20	0	—	0	21	34	
	70	0	—	0	—	1	30	0	—	3	31	2	18	0	—	1	14	1	22	2	16	0	—	0	—	0	10	21	
	60	0	—	0	—	0	—	1	15	3	28	0	—	0	—	0	—	0	—	1	23	2	20	0	—	0	8	20	
50	0	—	0	—	1	16	4	31	0	—	0	—	0	—	1	8	0	—	0	—	1	20	1	21	0	8	21		
40	1	24	0	—	1	36	1	49	1	38	0	—	0	—	0	—	0	—	0	—	1	17	1	6	0	6	26		
30	0	—	0	—	0	—	3	20	0	—	0	—	0	—	0	—	0	—	1	1	0	—	0	—	0	0	4	14	
20	0	—	0	—	0	—	1	40	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	0	1	40	
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

N - The number of cases the element has been observed during the month.

TN - The total number of cases the wind has been observed for all directions during the month.

**Table B 3. (Contd.)—NUMBER OF OCCURRENCES OF WIND DIRECTION WITHIN SPECIFIED RANGES AND THE MEAN SCALAR WIND SPEED AT THE STANDARD AND SELECTED PRESSURE SURFACES
ASWAN (A) — YEAR 1969**

Time	Pressure Surface (Millibar)	Wind between specified ranges of direction (000—360)*																				Number of Calm winds	Total Number of Observations (TN)	Mean Scalar wind Speed (Knots)				
		345		015		045		075		105		135		165		195		225		255					285		315	
		/		/		/		/		/		/		/		/		/		/					/		/	
		014	044	074	104	134	164	194	224	254	284	314	344	N	(ff)	N	(ff)	N	(ff)	N	(ff)				N	(ff)	N	(ff)
		m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m		
0000 U.T.	Surface	168	9	42	9	7	6	7	8	7	7	1	4	1	12	1	5	0	—	6	8	26	9	84	10	5	355	9
	1000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	850	43	12	58	11	39	11	14	10	21	7	5	4	8	8	7	9	17	9	36	9	44	11	48	12	0	340	11
	700	17	10	15	14	11	12	12	9	7	11	8	9	13	14	41	14	62	16	80	21	44	15	30	16	0	340	16
	600	8	13	4	8	7	10	5	10	8	12	3	11	11	16	43	18	73	22	102	22	56	16	17	17	0	337	21
	500	7	17	7	13	7	14	14	8	13	8	8	12	10	13	19	15	79	29	98	25	56	25	18	18	0	336	26
	400	8	12	8	9	4	14	13	10	11	10	10	8	7	14	20	20	71	45	113	39	53	38	12	22	0	330	34
	300	3	14	0	—	8	14	13	16	16	12	3	9	4	12	19	32	91	51	112	48	45	42	7	26	0	321	47
	250	2	20	0	—	3	10	14	16	19	19	3	14	3	12	21	45	77	65	112	55	43	66	11	55	0	308	56
	200	1	28	0	—	2	20	10	17	23	23	6	20	9	15	15	52	77	76	107	72	42	75	7	75	0	299	65
	150	0	—	0	—	1	24	7	24	31	28	7	13	9	22	8	51	68	61	106	70	40	76	2	82	0	279	61
	100	1	3	1	15	2	12	10	19	35	23	7	26	18	18	10	21	49	41	76	45	22	46	1	20	0	232	41
	70	1	11	0	—	3	18	32	20	25	19	7	17	9	14	4	17	29	23	41	26	10	28	1	14	1	163	24
	60	0	—	3	5	12	19	35	19	14	19	2	8	6	11	7	17	16	26	33	20	9	28	2	5	0	139	23
50	2	9	0	—	9	29	39	20	7	18	3	8	5	10	6	10	11	19	24	18	11	12	4	18	0	121	20	
40	1	10	2	16	10	20	33	22	7	22	4	16	2	8	3	12	8	20	19	15	4	17	3	9	2	98	20	
30	3	7	1	27	11	22	22	29	7	18	1	10	3	11	3	20	7	20	11	17	5	16	0	—	1	75	22	
20	1	15	0	—	6	28	13	33	1	45	1	10	4	9	1	7	2	12	3	15	3	21	1	4	0	36	26	
10	0	—	0	—	0	—	1	65	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	0	1	65
1200 T.U.	Surface	113	8	38	8	6	6	2	11	6	5	14	7	8	7	4	13	6	10	16	7	11	9	46	8	7	277	8
	1000	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	—	0	0	0
	850	38	11	21	13	25	11	18	7	12	6	11	8	14	6	7	9	16	10	33	10	38	11	42	12	0	275	10
	700	18	14	13	12	17	10	9	7	5	9	8	6	9	9	27	15	48	20	57	20	31	15	30	14	0	272	16
	600	9	10	8	10	8	6	2	3	7	10	2	6	13	13	23	19	55	23	69	23	45	21	25	16	0	266	21
	500	4	9	4	18	4	6	2	14	2	6	5	10	8	13	20	20	56	30	114	28	30	12	12	19	0	261	27
	400	3	8	2	12	3	9	8	11	6	17	0	—	4	15	19	29	56	41	110	38	42	44	5	17	0	258	38
	300	0	—	1	18	0	—	7	17	7	14	2	16	2	8	14	48	54	57	107	52	43	54	5	55	0	242	52
	250	0	—	0	—	2	14	8	15	5	12	3	15	3	12	8	50	60	76	97	60	47	65	7	61	0	240	63
	200	0	—	1	8	1	16	7	16	5	29	0	—	2	14	9	31	47	88	114	71	39	72	5	56	0	230	71
	150	0	—	0	—	1	11	5	23	8	31	2	15	5	16	9	29	35	71	99	73	26	72	2	56	0	192	67
	100	0	—	0	—	1	39	8	24	9	23	7	17	4	31	6	28	28	38	86	46	21	50	0	—	0	170	45
	70	0	—	0	—	2	10	14	21	5	25	1	13	6	16	7	22	20	24	34	24	14	20	3	21	0	106	24
	60	0	—	0	—	3	16	11	21	9	17	4	13	3	14	3	17	11	15	24	20	13	23	0	—	1	82	30
50	0	—	0	—	2	14	21	16	4	29	0	—	1	27	7	13	6	18	12	15	9	15	0	—	0	62	18	
40	1	37	1	5	2	10	15	16	5	24	2	8	1	8	3	18	6	20	2	12	3	16	1	19	2	44	16	
30	1	6	2	10	1	7	9	21	5	18	3	15	3	11	4	13	4	19	2	23	0	—	1	15	0	35	17	
20	0	—	0	—	1	47	9	24	1	14	1	10	0	—	2	28	1	20	3	16	0	—	1	5	0	19	10	

N — The number of cases the element has been observed during the month.

TN — The total number of cases the wind has been observed for all directions during the month.

ANNUAL REVIEW OF AGRO-METEOROLOGICAL STATIONS

TAHRIR — YEAR 1969

For the year as a whole the mean daily air temperature was slightly below average, the mean daily relative humidity was slightly above average and the total rainfall was below average.

The outstanding characteristic features of the year can be summarized in the following extreme mean values of elements acquired in the months of the year since the year 1961 :

- January** : the lowest mean maximum air temperature, the lowest mean actual sunshine duration.
- February** : the highest mean daily and mean maximum air temperature, the lowest monthly rainfall.
- March** : the highest mean daily, mean maximum and mean minimum air temperatures, the highest monthly rainfall, the lowest mean actual sunshine duration.
- April** : the lowest mean maximum air temperature, the lowest mean pan evaporation.
- June** : the highest mean actual sunshine duration.
- July** : the lowest mean daily, mean maximum and mean minimum air temperatures
- August** : the lowest mean daily, mean maximum and mean minimum air temperatures, the lowest mean pan evaporation.
- September** : the highest mean maximum air temperature.
- October** : the highest mean relative humidity.
- December** : the lowest mean minimum air temperature, the lowest monthly rainfall, the highest mean actual sunshine duration.

Comparing the mean values of elements in the different months of the year with the corresponding average values, we find the following :

The mean daily air temperature was above average in February, March, June & September ; below average in January, April, July, August, November & December ; and about average in May and October.

The mean daily relative humidity was above average in May & September ; and about average in the other months of the year.

The monthly rainfall was above average in January, March & May ; below average in February, April, November & December ; and about average in September & October.

The mean daily actual sunshine duration was below average in January, March, April & May ; above average in December ; and about average otherwise.

The mean daily pan evaporation was about average in February, March, November & December and below average otherwise.

The extreme maximum soil temperatures at depths between 2 and 100 were generally higher than the corresponding values of the year 1968 in January, February, March, June, October & December ; generally lower in April, May, July & August ; and the departures from last year were irregular in September and November.

The extreme minimum soil temperatures were generally higher than the corresponding values of the year 1968 in February, March, April, August, September, November & December ; generally lower than last year in January, May, June, & July ; and the departures were irregular in October.

BAHTIM - YEAR 1969

For the year as a whole the mean daily air temperature was slightly higher than last year, the mean daily relative humidity was slightly lower and the total rainfall was higher than last year.

Comparing the mean values of elements in the months of the year with the corresponding values of the year 1968, we find the following :

The mean daily air temperature was higher than last year in February, March, September, October & November ; lower than last year in July, and about the value of last year in January, April, May, June, August & December.

The mean daily relative humidity was lower than last year in February, March, April, May, September & December ; and about the value of last year in the other months of the year.

The total monthly rainfall was higher than last year in January, March, May & October ; lower than last year in April, November & December ; and weather was rainless in the other months of the year.

The mean daily actual sunshine duration was higher than last year in June & December ; lower than last year in January, March, April, May & October ; and about the value of last year in February, July, August, September & November.

The mean daily pan evaporation was higher than last year in February, March, & October ; lower than last year in January, May, June, July & August ; and about the value of last year in the other months of the year.

The extreme maximum soil temperatures at depths between 2 and 100 cm. were generally higher than last year in February, March, June & December ; generally lower than last year in July & August ; and the departures from last year were irregular in the other months of the year.

The extreme minimum soil temperatures were generally higher than last year in February, March, April, August, September & November ; generally lower than last year in June & July ; and the departures from last year were irregular in January, May, October & December.

KHARGA - YEAR 1969

For the year as a whole the mean daily air temperature and relative humidity were about average, and the total rainfall was slightly higher than average.

The outstanding characteristic features of the year can be summarized in the following extreme mean values of elements acquired in the months of the year since the year 1964 :

January : the lowest mean daily and mean minimum air temperatures, the lowest mean pan evaporation.

February : the highest mean daily, mean maximum and mean minimum air temperatures, the lowest mean relative humidity.

March : The highest mean daily, mean maximum and mean minimum air temperatures, the lowest mean relative humidity, the lowest mean actual sunshine duration, the highest mean pan evaporation.

- April** : the lowest mean daily and mean maximum air temperatures, the highest mean relative humidity, the highest monthly rainfall (2.3 mm.), the lowest mean actual sunshine duration the lowest mean pan evaporation.
- May** : the lowest mean pan evaporation.
- June** : the highest mean maximum air temperature, the lowest mean actual sunshine duration.
- July** : the lowest mean daily and mean maximum air temperatures, the highest mean relative humidity.
- September**: the highest mean daily, mean maximum and mean minimum air temperatures, the lowest mean relative humidity, the lowest mean actual sunshine duration, the highest mean pan evaporation.
- October** : the lowest mean actual sunshine duration, the highest mean pan evaporation.
- November** : the highest mean relative humidity.

Comparing the mean values of elements in the different months of the year with the corresponding values of the year 1968, we find the following :

The mean daily air temperature was higher than last year in February, March, September, October, November & December ; lower than last year in January, April, May & July ; and about the value of last year in June and August.

The mean daily relative humidity was higher than last year in January, April, July & November ; lower than last year in February, March & December ; and about the value of last year in the rest months of the year.

The year was rainless apart from trace in January and 2.3mm. in April, while in the year 1968 rain was confined to trace in April.

The mean daily actual sunshine duration was higher than last year in July ; lower than last year in March, April, May, June & October ; and about the value of last year in January, February, August, September, November & December.

The mean daily pan evaporation was higher than last year in February, July, September & October ; lower than last year in January, April, May & August ; and about the value of last year in the other months of the year.

The extreme maximum soil temperatures at depths between 2 and 100cm. were generally higher than last year in February, March, May, September, October, November & December ; generally lower than last year in January, April, July & August ; and the departures from last year were irregular in June.

The extreme minimum soil temperatures at depths between 2 and 100 cm. were generally higher than last year in February, March, September, October & November ; generally lower than last year in July & August ; and the departures from last year were irregular in the other months of the year.

**Table C 1.—AIR TEMPERATURE AT 1½ METRES ABOVE GROUND
YEAR — 1969**

STATION	Air Temperature (°C)					Mean Duration in hours of daily air temperature above the following values										
	Mean Max.	Mean Min.	Mean of the day	Night time mean	Day time mean	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C
Tahrir	28.3	14.1	20.4	17.2	23.1	24.0	24.0	23.9	22.3	18.2	12.4	6.0	2.5	0.3	0.01	0
Bahtim	28.2	12.6	20.0	16.3	23.0	24.0	24.0	23.7	21.8	17.6	11.7	6.0	2.6	0.3	0.02	0
Kharga	32.9	16.8	25.1	21.8	27.9	24.0	24.0	23.6	22.6	20.4	17.1	12.7	7.3	3.4	0.7	0.03

**Table C 2.—EXTREME VALUES OF AIR TEMPERATURE AT 1½ METRES ABOVE GROUND, ABSOLUTE MINIMUM AIR TEMPERATURE AT 5cms ABOVE GROUND OVER DIFFERENT FIELDS
YEAR — 1969**

STATION	Max. Temp. at 1½ metres				Min. Temp. at 1½ metres				Min. Temp. at 5 cms. above			
	Highest		Lowest		Highest		Lowest		Dry Soil		Grass	
	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date
Tahrir	43.8	16/6	11.8	28/1	22.8	16/6	2.1	7/12	0.8	8/12	—	—
Bahtim	46.4	16/6	12.2	28/1	21.3	16/6	0.8	1/2	— 1.1	2/2	—	—
Kharga	47.5	16/6	15.8	29/1	31.2	16/6	0.4	10/1	— 1.6	10/1	—	—

**Table C 3.—(SOLAR + SKY) RADIATION, DURATION OF BRIGHT SUNSHINE, RELATIVE HUMIDITY & VAPOUR PRESSURE AT 1½ METRES ABOVE GROUND, EVAPORATION & RAINFALL
YEAR — 1969**

STATION	Solar+Sky Radiation gm. cal/cm²	Duration of Bright Sunshine (hours)			Relative Humidity %				Vapour Pressure (mma)						Evaporation (mma)		Rainfall (mma)		
		Total Actual	Total Possible monthly	%	Mean of day	1200 U.T.	Lowest	Date	Mean of day	1200 U.T.	Highest	Date	Lowest	Date	Piche	Pan class (A)	Total Amount monthly	Max. fall in one day	Date
Tahrir	505.7	3459.9	4443.0	77	67	42	8	26/3	11.9	11.2	21.9	8/9	1.1	6/1	7.1	7.44	24.8	7.4	2/1
Bahtim	514.3	3330.1	4442.8	74	65	40	4	8/6	11.3	10.8	21.6	15/8	3.0	9/12	7.8	7.40	24.6	6.2	12/1
Kharga	463.0	(*) (37745)	(4400.0)	88	32	21	4	8/6	7.2	7.2	17.6	1/9	1.8	8/6	19.1	15.03	2.3	1.5	15/4

(*) Actual number of sunshine records was at Kharga 362 days only.

Note : Agro-Meteorological Data for El Kasr are not included since the observations at that station were interrupted during the year 1969.

TABLE C 4.— EXTREME SOIL TEMPERATURE AT DIFFERENT DEPTHS IN DIFFERENT FIELDS (CMS)

YEAR 1969

Station	Highest (H) Lowest (L)	Dry field								Grass field							
		2	5	10	20	50	100	200	300	2	5	10	20	50	100	200	300
Tahrir	H	56.4	50.6	43.8	38.2	32.6	30.6	29.2	28.3	—	—	—	—	—	—	—	—
	Date	14,15/6	14/6	15/6	16/6	17/6	28,30/8* & 6/9*	3/9	27,30/9* & 9/10*	—	—	—	—	—	—	—	—
	L	3.3	5.0	7.6	10.6	13.1	16.2	19.1	20.8	—	—	—	—	—	—	—	—
	Date	6/1	6/1	6/1	30/1	29/1	30,31/1 & 1/2	7,8,9/2*	21,27/2	—	—	—	—	—	—	—	—
Baktim	H	57.7	47.0	40.2	34.9	32.2	30.7	28.1	26.7	—	—	—	—	—	—	—	—
	Date	16/6	16/6	16/6	15/8	17/8	26,27/8* & 12/9	29,30/9* 11/10*	30/10* 3,6/11*	—	—	—	—	—	—	—	—
	L	4.3	6.5	10.3	14.0	17.2	19.5	21.7	22.5	—	—	—	—	—	—	—	—
	Date	15/1	15/1	30/1	29,30/1	19,21/1	6,7,8/2	27,28/2* 11/3*	31/3	—	—	—	—	—	—	—	—
Kharga	H	59.2	52.1	44.5	38.7	35.3	33.4	31.5	30.5	—	—	—	—	—	—	—	—
	Date	27/6	16/6	16/6	16/6	7,8/8	8,9,10/9*	12,13, 14/10*	31/10	—	—	—	—	—	—	—	—
	L	4.1	6.7	11.1	15.2	18.7	21.6	24.5	26.4	—	—	—	—	—	—	—	—
	Date	6,7/1	6/1	30/1	30,31/1	31/1,3/2	2/2	3/3	22,25/3* & 1/4	—	—	—	—	—	—	—	—

* More than 3 days

Note : Agro Meteorological Data for El-Kasr are not included since the observations at that station were interrupted during the year 1969 .

Table C 5.—SURFACE WIND

YEAR — 1969

STATION	Wind Speed m/sec at 1½ metres			Days with surface wind speed at 10 metres							Max. Gust (knots at 10 metres)	
	Mean of the day	Night time mean	Day time mean	≥ 10 knots	≥ 15 knots	≥ 20 knots	≥ 25 knots	≥ 30 knots	≥ 35 knots	≥ 40 knots	value	Date
Tahrir	2.4	1.7	3.0	337	178	52	22	7	2	0	45	17, 19/3
Bahtim	2.4	1.6	3.3	303	151	39	18	4	0	0	43	17/3
Kharga	3.7	2.8	4.5	336	265	146	52	9	1	0	42	21, 29/3

Note : Agro-Meteorological Date for El-Kasr are not included since the observations at that station were interrupted during the Year 1969.

PRINTED IN ARAB REPUBLIC OF EGYPT
BY THE GENERAL ORGANIZATION
FOR GOVT. PRINTING OFFICES, CAIRO

First Under-Secretary of State

ALY SULTAN ALY

Chairman of the Board of Directors

8416-1971-200